Ontario

Ontario Geological Survey
Open File Report 6081

Report of Activities, 2001
Resident Geologist Program

Thunder Bay South Regional
Resident Geologist Report:
Thunder Bay South District

2002

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ONTARIO GEOLOGICAL SURVEY

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Thunder Bay South Regional Resident Geologist Report:
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by

B.R. Schnieders, J.F. Scott, M.C. Smyk, D.P. Parker and M.S. O'Brien

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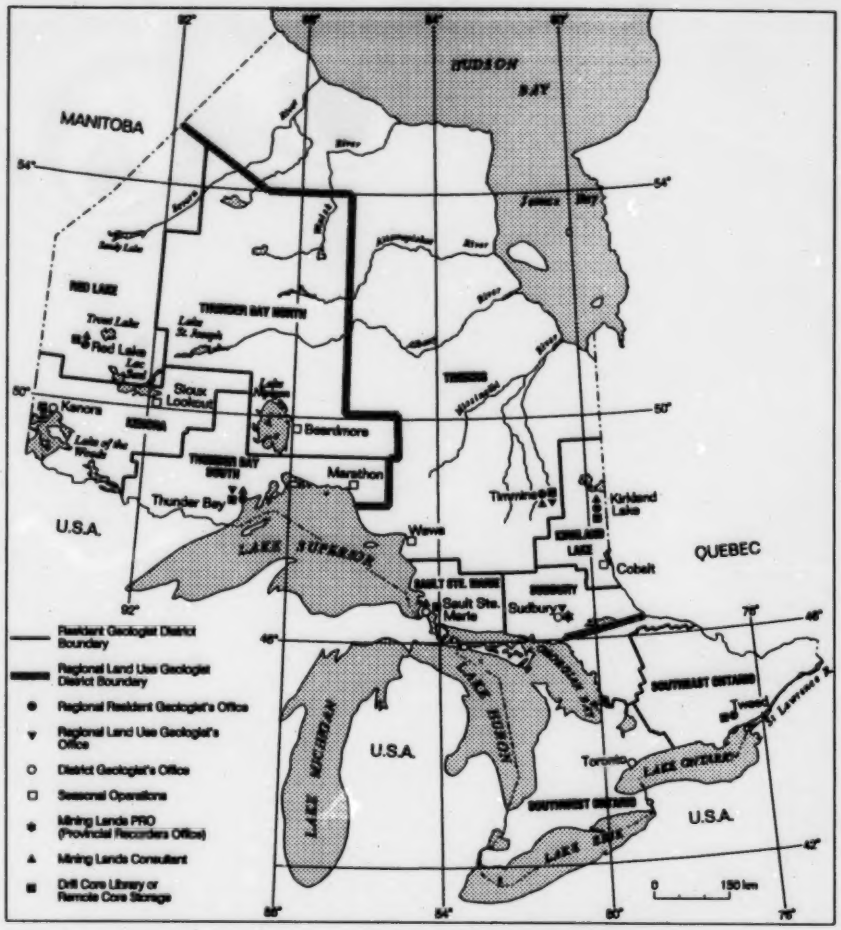

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Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Thunder Bay South Regional Resident Geologist (Thunder Bay South District)—2001

by

B.R. Schnieders, J.F. Scott, M.C. Smyk, D.P. Parker, and M.S. O'Brien

2002

CONTENTS

Thunder Bay South District—2001

INTRODUCTION 1
MINING ACTIVITY 1
Agate 1
Thunder Bay Agate Mine 1
Amethyst 1
Stone 2
Ruby Lake Marble Ltd. 2
Gold 2
David Bell Mine 2
Golden Giant Mine 3
Williams Mine 3
Platinum Group Elements 3
Lac Des Iles Mine 3
EXPLORATION ACTIVITY 10
Mining Lands 10
Nickel - Copper - Platinum Group Element (PGE) Exploration 10
Gold Exploration 11
Base Metal Exploration 12
Diamond Exploration 12
RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES 20
PROPERTY EXAMINATIONS 22
Stares/Calvert Property, Aldina Township 22
Amethyst Occurrences in the Ancliff Area 26
North Elbow Lake Property 28
Roaring River Property 29
RECOMMENDATIONS FOR EXPLORATION 31
Platinum Group Element Exploration Models 31
Rare Metal Pegmatites in the Highway 527 Area 32
Potential Applications of an Olympic Dam Model in the Nipigon Basin 32
Gold in the Smoke Lake Area 34
OGS ACTIVITIES AND RESEARCH BY OTHERS 35
ACKNOWLEDGEMENTS 42
REFERENCES 42

Tables

Table 1. Mine production and reserves in the Thunder Bay South Resident Geologist's District in 2001 4

Table 2. Assessment files received in the Thunder Bay South Resident Geologist's District in 2001 5

Table 3. Exploration activity in the Thunder Bay South Resident Geologist's District in 2001 15

Table 4. Property visits conducted by the Thunder Bay South Resident Geologist's Office in 2001 21

Table 5. Publications received by the Thunder Bay South Resident Geologist's Office in 2001 37

Table 6. Mineral deposits not being mined in the Thunder Bay South Resident Geologist's District in 2001 38

Figures

Figure 1. Thunder Bay South Resident Geologist's District, (western portion), exploration activity, 2001 13

Figure 2. Thunder Bay South Resident Geologist's District, (Schreiber–Hemlo portion), exploration activity, 2001 14

Figure 3. Geology of the newly discovered massive sulphide occurrence, Stares/Calvert property 24

Figure 4. Amethyst vein occurrences in the Ancliff area 27

THUNDER BAY SOUTH REGIONAL RESIDENT GEOLOGIST (THUNDER BAY SOUTH DISTRICT)—2001

B.R. Schnieders[1], J.F. Scott[2], M.C. Smyk[2], D.P. Parker[2] and M.S. O'Brien[3]

[1]Regional Resident Geologist, Thunder Bay South District, Ontario Geological Survey

[2]District Geologist, Thunder Bay South District, Ontario Geological Survey

[3]Regional Support Geologist, Northwest Region, Ontario Geological Survey

INTRODUCTION

The Thunder Bay South District covers an area from Calm Lake, west of Atikokan, east to White River, and north to Armstrong from the U.S. border. The District Program is based in Thunder Bay, but also maintains a seasonal field office in Marathon.

MINING ACTIVITY

There were four producing, precious and base metal mines, as well as a marble quarry, several amethyst producers and an agate mine in the Thunder Bay South District in 2001.

Agate

THUNDER BAY AGATE MINE

The Thunder Bay Agate Mine opened in July 1997, and is located in MacGregor Township, on the west side of Highway 527 (Spruce River Road), 1 km north of the intersection with Highway 11-17. The mine is owned by D. Seargeant and N. Maunula. It is estimated that up to 30 000 people visited the site in 2000 (D. Seargeant, Thunder Bay Agate Mine, personal communication, 2001).

Agate occurs as a conformable layer or vein hosted by flat-lying, Animikie sedimentary rocks, in contact with a diabase sill. The agate layer varies up to 1 m in width and has been traced by stripping over a 1 km strike length. The banded and variegated agate has been previously referred to as fortification agate and Current River agate, and varies in colour (e.g., colourless, white, grey, black, yellow, orange, blue, beige, buff and red). The agate likely formed in an open-space environment, as evidenced by stalactitic textures and concentrically zoned orbicules (Thunder Bay Agate Mine, World Wide Website, http://www.agatemine.com).

Amethyst

Two areas northeast of Thunder Bay are well-known for amethyst veins and production. In the area along the Magone Lake Road, north of MacGregor Township, five sites see periodic, small-scale extraction of amethyst. In McTavish Township, eight deposits are accessible from the Trans-Canada Highway, four of which operate as seasonal tourist attractions. The Blueberry Amethyst patch also operates as a seasonal tourist attraction, southwest of Kakabeka Falls.

Local deposits and mines are listed below:

Deposit / Mine	Location	Owner(s)
Amethyst Mine Panorama	McTavish Township	S. and T. Lukinuk
Ancliff Station Amethyst Quarry	McTavish Township	C. Anderson
Bak Quarry	McTavish Township	D. Bak
Blueberry Amethyst Patch	Marks Township	J. and T. Hakala
Blue Points Amethyst Mine	McTavish Township	F. Grann
Boulder Creek Amethyst	North of MacGregor Township	C. Anderson
Breezy Mountain Amethyst Mine	McTavish Township	T. Twomey
Crystal Creek Amethyst Mine	North of MacGregor Township	R. Hietapakka
Diamond Willow Amethyst Mine	McTavish Township	D. Noyes
Gem Mountain Amethyst Mine	North of MacGregor Township	O. and R. Harty
Keetch Amethyst Quarry	McTavish Township	N. Keetch
Ontario Gem Amethyst Mine	McTavish Township	P. Marino
Purple Haze Mine	North of MacGregor Township	M. and S. Grieve
Thibault Amethyst Quarry	North of MacGregor Township	D. Thibault

Stone

RUBY LAKE MARBLE LTD.

The Ruby Lake Marble Ltd. quarry, located approximately 10 km southeast of Nipigon, is owned and operated by D. MacAlpine and G. Landry. Variegated, multi-coloured, banded marble was quarried for landscaping stone. An estimated 1276 tons of marble were quarried and shipped in 2001 (D. MacAlpine, Ruby Lake Marble Ltd., personal communication, 2001). The stone was shipped to southern Ontario, Alberta, Saskatchewan, Manitoba, Michigan, Wisconsin, Minnesota and Pennsylvania (ibid.). Approximately 100 tons of red siltstone from an adjacent site was also shipped. There was some test splitting of 8- to 10-inch garden wall blocks. A maximum of 8 people were employed on-site during the summer months (ibid.). Additional information is provided on the company's World Wide Website (http://www.rubylakemarble.com).

This marble consists of metamorphosed, Mesoproterozoic, Rossport Formation (Sibley Group) dolostone and other, calcareous sedimentary rocks in the contact metamorphic aureole of Keweenawan diabase sills. It has previously been termed Nipigon River marble and was quarried from 1883 to ca. 1910 at a site on the eastern side of the Nipigon River, approximately 6 km west of the Ruby Lake quarry (Hinz et al. 1994).

Gold

The three Hemlo mines (David Bell, Golden Giant and Williams mines) continue to produce gold from the Hemlo deposit. Ownership changes at all three mines resulted from three mergers that were announced in 2001. Homestake Mining Company and Teck Corporation, who shared ownership of the David Bell and Williams Mines, merged with Barrick Gold Corporation and Cominco Ltd., respectively. The merger of Battle Mountain Gold Company, with a wholly owned subsidiary of Newmont Mining Corporation, was approved by Battle Mountain shareholders on January 5, 2001.

DAVID BELL MINE (TECK-CORONA OPERATING CORPORATION)

Production from the David Bell Mine (Teck Cominco Limited (50%)/Barrick Gold Corporation (50%)) from January 1 to December 31, 2001, consisted of 151 976 recovered ounces of gold (163 064 feed ounces) from 455 004 t milled at a mill feed grade of 11.15 g/t gold (T. Madill, Teck-Corona Operating Corporation, personal communication, 2002).

As of January 1, 2002, proven reserves totaled 3 199 512 t (diluted) at a grade of 10.44 g/t gold, containing 1 074 276 ounces of gold. Measured and indicated reserves were estimated to be 809 349 t grading 4.93 g/t gold, containing 128 259 ounces of gold (ibid.).

Underground diamond drilling targeted the "D" zone east of the shaft, where approximately 120 000 ounces were added to the reserves (ibid.).

GOLDEN GIANT MINE (NEWMONT CANADA LIMITED)

Reserve figures and production statistics for 2001 for the Golden Giant Mine (Newmont Canada Limited) were not available at the time of publication. Production from the Golden Giant Mine from January 1 to December 31, 2000, consisted of 334 000 recovered ounces of gold from 1 070 456 t milled at a grade of 9.88 g/t gold (H. Lockwood, Battle Mountain Canada Ltd., personal communication, 2001). Reserves as of January 1, 2001, stood at 4 335 500 t at a grade of 9.8 g/t gold (i.e., 1 369 000 contained ounces of gold, fully diluted) (ibid.).

WILLIAMS MINE (WILLIAMS OPERATING CORPORATION)

The Williams Mine (Teck Cominco Limited (50%)/Barrick Gold Corporation (50%)) recovered 446 000 ounces of gold from 3 038 000 tonnes of ore, from January 1, 2001, to December 31, 2001 (G. Skrecky, Williams Operating Corporation, personal communication, 2002). Reserve figures for 2002 for the Williams Mine were not available at the time of publication.

Platinum Group Elements

LAC DES ILES MINE (LAC DES ILES MINES LTD.)

North American Palladium Ltd. produced palladium, platinum, nickel, copper, cobalt and gold from its Lac des Iles Mine, 100 km north of Thunder Bay. Production figures for 2001 are given below (North American Palladium Ltd., World Wide Website, http://www.napalladium.com; D. Kim, North American Palladium Ltd., personal communication, 2002):

Tonnes Milled	Palladium (ounces)	Gold (ounces)	Platinum (ounces)	Copper (pounds)	Nickel (pounds)	Cobalt (pounds)
2 662 240	127 478	9813	10 566	3 064 321	1 605 783	70 141

The average feed grade for 2001 was 2.188 g/t palladium (D. Kim, North American Palladium Ltd., personal communication, 2002).

Following an extensive exploration program completed in 1999, and a detailed feasibility study completed in May 2000, the company embarked on a mine expansion program at Lac des Iles which expanded mill throughput from 2400 tonnes per day to 15 000 tonnes per day, and increased annual palladium production to 250 000 ounces over a 17-year mine life. The $220 million expansion project was commissioned in the second quarter of 2001. By the end of 2001, mill throughput was expected to increase to the nameplate capacity of 15 000 tonnes per day (North American Palladium Ltd., World Wide Website, http://www.napalladium.com). From May 10 to August 15, 2001, three diamond drill rigs completed 17 holes (15 553 m) and extended 12 previously drilled holes (2871 m). This drilling was focused on the down-plunge extension of the Main High Grade Zone (MHGZ)(previously referred to as the "High-Grade Shear Ore ") and the newly discovered Offset High Grade Zone below 560 m. Highlights included:

- New High Grade Zone discovered to a depth of 903 m over a strike length of 300 m and remains open in all directions

- New High Grade Zone contains a 54 m intersection grading 5.44 g/t palladium, including 10.5 m grading 10.32 g/t palladium
- Strike length of MHGZ extended to 390 m and remains open to the north and at depth

There was also exploration slated to delineate resources from the Breccia ore in the southwestern extension of the Roby Zone (company press release, September 25, 2001).

Table 1. Mine production and reserves in the Thunder Bay South District in 2001.

Mine	Production to end of 2000		Production in 2001		Reserves at end of 2001	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
David Bell Mine	6 638 356 t @ 0.475 ounce gold per tonne (= 14.79 g/t Au)	2 982 460 ounces gold	455 004 t @ 11.15 g/t gold	151 976 ounces gold[1]	3 199 512 t	10.44 g/t gold
Golden Giant Mine	15 598 773 t @ 0.386 ounce gold per tonne (= 12.01g/t gold)	5 652 410 ounces gold	N/A	N/A	N/A	N/A
Lac des Iles Mine	5 288 311 t	505 991 ounces palladium, 32 470 ounces gold, 34 013 ounces platinum, 8 015 400 pounds copper, 6 170 166 pounds nickel	2 662 240 t @ 2.188 g/t Pd	127 478 ounces palladium, 9813 ounces gold, 10 566 ounces platinum, 3 064 321 pounds copper, 1 605 783 pounds nickel	96 163 000 t[2]	1.55 g/t Pd[2], 0.12 g/t Au[2], 0.17 g/t Pt[2], 0.06% Cu[2], 0.05% Ni[2]
Williams Mine	31 977 404 t @ 0.211 ounce gold per tonne (=6.56 g/t Au)	6 398 815 ounces gold	3 038 000 t	446 000 ounces gold	N/A	N/A

[1] *includes 512 ounces recovered from sedimentation pond in 1998*
[2] *Proven and probable reserve figure statement, December 31, 2000*

Table 2. Assessment files received in Thunder Bay South in 2001.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Linecutting
Met ..... Metallurgical testing
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Adrian Township	Middaugh, R.	1998	GEM, GM, Str, Samp	OP98-192-40	52A05/NW
Aldina and Marks townships	RJK Explorations Ltd.	2001	IP	2.21507	52A05/NW
Aldina, Sackville and Marks townships	RJK Explorations Ltd., Fenwick, K. and Stares, S.	2000	IP, RES	2.20899	52A05/NW
Aldina Township	RJK Explorations Ltd. and Greater Lenora Resources	2000	GEM, GM	2.21058	52A05/NW
Aldina Township	RJK Explorations Ltd. and Greater Lenora Resources	2000	Tr, Samp	2.21057	52A05/NW
Bedivere Lake	Eveleigh, A. and Gagne, P.	1999	GEM, GM, Lc	2.20940	52B15/SW
Begin Township	Eveleigh, A.	1998	Pr, Samp	OP98-365	52B09/SW
Begin Township	Kukkee, R.	1998	Pr, Samp	OP98-121	52B09/SW
Bomby, Brothers and Laberge townships	Lac Exploration Inc. and Teck Exploration Ltd.	2000	GL, Samp	2.21543	42C12/NW/NE
Brothers Township	Lac Exploration Inc. and Teck Exploration Ltd.	2000	DD, Samp	2.21527	42C12/NW
Cheeseman and Kitchen lakes	Colby Resources Corp.	2000	IP, Lc	2.20912	52H06/NW, 52H11/SW

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Cirrus and Louis lakes	Freewest Resources Canada Inc.	2000	GL, Pr, Lc, Samp	2.21017	42D16/NE/NW
Coldwell Township	Morgan, J.	2000	Samp	2.20717	42D15/SE
Conacher Township	Clark, G.	1998	Pr, Str, Samp	OP98-311	52B09/NE/SE
Conacher Township	Traverse, A.	1998	DD, Samp	OP98-316	52B09/NE
Crooked Pine Lake	Gagne, P.	2000	Pr, Samp	2.20943	52B15/SW, 52B14/SE
Dawson Road Lots	Clark, G.	1998	GEM, GM, Pr, Samp	OP98-311	52A12/SW
Dawson Road Lots	Martin, J.	1998	Str, Samp	OP98-133	52A12/SW
Dawson Road Lots and Goldie Township	Martin, J.	1998-99	GL, Str, Samp	2.19287	52A12/SW
Dawson Road Lots and Goldie Township	Martin, J.	1998-99	Pr, Str, Tr, Samp	2.19287	52A12/SW
Disraeli Lake	Avalon Ventures Ltd.	2000	DD, Samp	2.21021	52H02/SW/NW
Duckworth Township	Fournier, E.	2000	Pr, Tr, Samp	2.20898	52B09/SE
Eaglehead Lake	Redden, J.	1998	Test Quarry	OP98-044	52H03/SE
Factor and Beaverhouse lakes	Starcore Resources Ltd., ProAm Explorations Corp., Bond, J. and Johnson, S.	1999	DD, Samp	2.20584	52C09/NE/SE
Fallis and Goodfellow townships	East West Resource Corp. and Valerie Gold Resources Ltd.	2001	GM, IP, Lc	2.21651	52B16/SW/SE
Freeborn Township	Fenwick, K.	1998	Pr, Samp	OP98-200	52B13/SE
Geikie Lake	Canplats Resources Corp. and Colby Resources Corp.	2001	GM, IP, Lc	2.21297	52H06/NW, 52H11/SW
Geikie Lake	Colby Resources Corp. and Canplats Resources Corp.	2000	AEM, AM, GEM, IP	2.20923	52H06/NW/NE, 52H11/SW
Gorham Township	Pitkanen, R.	1998	Pr, Samp	OP98-196	52A11/SW
Gravel River	Reukl, R.	2000	GEM, Lc	2.21292	42E04/SE
Havoc Lake	East West Resource Corp.	2001	AEM, AM	2.22136	52H14/NE

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Hele Township	East West Resource Corp. and Canadian Golden Dragon Res. Ltd.	2001	GM, IP, Lc	2.21350	52A16/NW
Hele Township	Fenwick, K.	1998	Pr, Samp	OP98-200	52A16/NW
Horne and Laurie townships and Dawson Road Lots	Kukkee, T. and Andreason, R.	1998	Pr, Str, Samp	OP98-156/157	52A12/SW
Jean Township	Gurney, S.	2000	Str, Tr	2.20592	52B08/SE
Junior Lake	Brancote Canada Ltd. and Landore Resources Inc.	2000	GL, Remote Sensing, Samp	2.20840	42L05/NW/SW
Lac des Iles	Buck Lake Ventures Ltd. and LMX Resources Ltd.	2000	GL, Pr, Samp	2.21416	52H04/NW, 52G01/NE
Lac des Iles	East West Resource Corp. and New Millennium Metals Corp.	2001	GM, IP, Lc	2.22143	52H04/SE
Lac des Iles	Lac des Iles Mines Ltd. and Patricia Mining Corp.	1999	IP, Lc	2.20868	52H04/NE
Lac des Iles, Shelby, Max and Whitefin lakes	Avalon Ventures Ltd. and Storcore Resources Ltd.	2000	IP, RES, GL, GM, Tr, DD, Samp	2.20867	52H04/NE/SE, 52H03/NW/SW
Leckie Lake	Avalon Ventures Ltd.	2000	DD, Samp	2.21989	52H02/SW
Leckie Lake	Fenwick, K.	1998	Pr, Samp	OP98-200	52H02/SW/NW
Lorna and Cirrus lakes	Wahl, R.	1998	Pr, Samp	OP98-259	42D16/SE/NE
Lower Aguasabon and Santoy lakes	Shuman, M. and Fowler, B.	1998	GEM, GL, Pr	OP98-098/-060	42D14/NE, 42D15/NW
Lower Aguasabon and Upper Aguasabon lakes	Michano, D.	1998	GC, Samp	OP98-215/-301	42D14/NE, 42E03/SE
MacGregor Township	Smith, B.	2001	DD	2.21905	52A11/SE
Manitouwadge Township	Noranda Inc.	1999	Borehole Transient EM, DD, Samp	2.20864	42F04/NW/NE
Marks Township	Falconbridge Ltd.	2000	Humus GC, Samp	2.21067	52A05/NW
Marks Township	Whalen Resources Ltd.	2001	Tr	2.21773	52A05/NW
Max Lake	Kukkee, E. & Kwiatkowski, R.	1998	Tr, Samp	OP98-113/-114	52H03/NW

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
McOuat and Sharp lakes	East West Resource Corp.	2000	IP, Lc	2.20659	52B12/NW
Mikinak Lake	Fenwick, K.	2001	GM, IP, Lc	2.21648	52H07/SW
Miranda Lake	Bjorkman, K. and Nelson, B.	1998	GC, Pr, Samp	OP98-404/-405	52B13/SW
Mooseland and Sharp lakes	Richmond, W.	2000	Tr, Samp	2.20880	52G08/SE, 52G01/NE
Moss and Burchell townships	Moss Lake Gold Mines Ltd.	2001	GM, VLFEM	2.21316	52B10/SE/SW
Nym Lake	Band-Ore Resources Ltd.	1999	DD, Samp	2.20985	52B11/NW
Olie and Thomas lakes	Gionet, G. and Gionet, M.	1998	Beep, Tr, Samp	OP98-102/-103	42F05/SE/NE
Oliver Township	Christianson, D.	1998	Pr, Samp	OP98-049	52A05/NE, 52A12/SE
Pic Township	Homestake Canada Inc. and Teck Exploration Ltd.	1999	DD, Samp	2.21788	42D09/NW
Pic Township	Kusserow, G. and Wahl, R.	2001	GC, GL, Samp	2.22044	42D09/NW
Pickerel Lake N.	East West Resource Corp.	2000	GM, IP, Lc	2.20658	52B11/NW
Pickerel Lake N.	East West Resource Corp.	2001	GM, Lc	2.20887	52B11/NW
Posh Lake	Canplats Resources Corp., Colby Resources Corp. and East West Resource Corp.	2000	AEM, AM, GL	2.20922	52H06/SW/SE/NW/NE
Poshkokagan Lake	Colby Resources Corp. and East West Resource Corp.	2001	GEM, GM, IP, Lc	2.20913	52H06/NE/NW/SW/SE
Poshkokagan Lake	Canplats Resources Corp. and East West Resource Corp.	2001	GM, IP, Lc	2.21349	52H06/NE/SE/SW/NW
Powell Lake	Kukkee, E. and Kwiatkowski, R.	1998	Tr, Samp	OP98-113/-114	52B07/NW
Priske Township	Fenwick, K. and Leishman, D.	2000	Pr, Samp	2.20818	42D14/SE
Priske Township	Skalesky, A.	1998	Pr, Tr, DD, Samp	2.20535	42D14/SW
Priske Township	Skalesky, D. and Lundstrom, L.	1998	Tr, Samp	OP98-365/-357	42D14/SW

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Priske Township	Wing Resources Inc.	1999	Pr, Samp	2.20646	42D14/SE
Puddy Lake	Canadian Golden Dragon Res. Ltd. and New Millennium Metals Corp.	2000	GL, Samp	2.20956	52H13/NE
Puddy Lake	Christianson, D. and Neilly, P.	1999-2000	Pr, Samp	2.20955	52H13/NE
Roberta and Herbert townships	Freewest Resources Canada Inc. and Gionet, G.	2000	Pr, Samp	2.20743	42F04/NE/SE
Rous Lake	Homestake Canada Inc. and Teck Exploration Ltd.	1999	IP	2.21357	42D09/NE
Samuel Island, Whalen and Harnet lakes	ProAm Explorations Corp.	1998	GC, GL, Samp	2.20498	52C09/NE/NW
Santoy Lake	Cameco Corporation	2000	GM, Lc	2.21042	42D15/NW
Santoy Lake and Syine Township	Cameco Corp, Daniels, G. and Ferguson, J.	2000	GC, GL, Str, Samp	2.20758	42D15/NW/SW
Scoble and Gillies townships	McWilliams, P. and Redden, J.	1998	Tr	OP98-044	52A05/SE
Scoble and O'Connor townships	McWilliams, P.	1997	GC, Str	2.18183	52A05/SE
Seeley Lake	Freewest Resources Canada Inc.	2000	GL, AEM, AM, Str	2.21410	42D16/SW
Seeley Lake	Freewest Resources Canada Inc.	2000	AEM, AM	2.21453	42D16/SW
Senga Lake	New Millennium Metals Corp.	2000	GL, Samp	2.20961	52H04/SW
Shabotik River	Freewest Resources Canada Inc.	2000	AEM, AM	2.21463	42C14/NW, 42F03/SW
Shabotik River	Freewest Resources Canada Inc.	2000	GL, Samp	2.21081	42C14/NW
Stucco, Posh and Geikie lakes	Canplats Resources Corp.	2000	AEM, AM	2.20917	52H03/NE, 52H06/SW/NW, 52H11/SW
Syine Township	Daniels, G.	2000	Str, Tr	2.20626	42D15/SW
Tartan Lake	Ceci, J.	2000	Str	2.20700	52A10/NW
Tartan Lake	Ceci, J.	2000	Str	2.20819	52A10/NW
Tartan Lake	Siltamaki, A.	2000	Pr, Str, Tr, Samp	2.20714	52A10/NW

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Tib and Armistice lakes	Lac des Iles Mines Ltd.	2001	GM, IP, Lc	2.20952	52H05/SW, 52H04/NW
Tib and Sharp lakes	Lac des Iles Mines Ltd.	2001	GM, IP, Lc	2.21041	52H04/NW, 52G01/NE
Tib Lake	Fort Knox Gold Resources Inc. and New Millennium Metals Corp.	2000	GC, Samp	2.21509	52H04/NW
Tilly and Powell lakes	Kukkee, E. and Kwiatkowski, R.	1998	Tr, Samp	OP98-113/-114	52B10/SW, 52B07/NW
Tuuri Township	Gionet, B.	1999	GC, Pr, Tr, Samp	2.20585	42D15/SW
Vert Island	MacAlpine, D.	2000	Str, Tr, Samp	2.20908	52A16/NE
Wabikon Lake	Wagg, C.	2000	Pr, Tr, Samp	2.20744	52H06/SW
Walsh Township	Tremblay, M.	1998	Pr, Samp	OP98-155	42D15/SW/SE

EXPLORATION ACTIVITY HIGHLIGHTS

Mining Lands

As of December 31, 2001, there were 8204 active claims, totalling 48 746 claim units, in the Thunder Bay Mining Division (comprising both the Thunder Bay South and Thunder Bay North districts). 1341 claims, totalling 14 527 claim units, were recorded in the Division in 2001.

Nickel-Copper-Platinum Group Element Exploration

North American Palladium Limited completed a deep drilling program at the Lac des Iles Mine and announced the discovery of a new high-grade zone (the fault-offset extension) where more than 20 deep holes were drilled. The zone was traced between vertical depths of 560 and 903 m over a strike length of 300 m. Diamond drill hole 52 returned 54 m grading 5.44 g/t palladium, including 10.5 m of 10.32 g/t palladium (*The Northern Miner*, December 3-9, 2001).

Placer Dome (CLA) Limited funded a $1.0 million exploration project under the terms of an option and joint-venture agreement with **Avalon Ventures Ltd.** and **Starcore Resources Ltd**. The work was 80% completed by year-end and consisted of extensive detailed geological mapping, overburden trenching, induced polarization (IP) and magnetic geophysical surveys, lithogeochemical sampling, prospecting and two, short diamond drilling programs totaling 2266 m in 11 holes. The work has generated numerous new targets on the property and identified additional economic-grade mineralization in the Poplar Zone, assaying up to 5.12 g/t palladium + platinum, 0.5% Cu and 0.3% Ni over 0.97 m (Avalon Ventures Ltd., Annual Report, 2001).

Platinum Group Metals Ltd. merged with **New Millennium Metals Corporation**, and the new company will have a land position of more than 350 km^2 in the Lac des Iles area. New Millennium, in joint venture with **New Claymore Resources Ltd.**, discovered the Stinger Zone, where grab samples assayed up to 7.47 g/t palladium + platinum + gold. Channel samples returned values up to 4.19 g/t palladium + platinum + gold over 1.7 m. Platinum Group Metals Inc. has completed over 1071 m of diamond drilling in seven

holes along a 2.3 km long grid on its South Legris property in the Vande gabbro intrusive complex (*London Mining Journal*, November 2001). Channel sampling from the Vande occurrence graded 2.28 g/t palladium + platinum + gold across 5 m (company press release, September 10, 2001).

Geomaque Explorations Ltd. has outlined two additional prospective zones on its Marathon Project. The joint-venture program with **Polymet Mining Corp.** has led to the development of total measured and indicated resource of 1 768 000 ounces of palladium and platinum (company news release, October 16, 2001).

L.E.H. Ventures Ltd. continues to drill test the Geordie Lake zone in the Coldwell alkalic complex. Hole 01-13 included a 28 m section which returned 0.68% Cu, 0.02% Ni, 1.21 g/t palladium, 0.09 g/t platinum and 0.20 g/t gold (*Canada Stockwatch*, November 6, 2001).

Buck Lake Ventures Ltd. discovered high-grade PGE mineralization on their Buck Lake property. Selected grab samples of mineralized pyroxenite assayed 31.6 g/t palladium, 2.82 g/t platinum, 9.96% Ni, and 1.53% Cu. The sample contained 5% coarse-grained magnetite, disseminated magnetite and 50 to 60% coarse-grained blebs and disseminated grains of pentlandite, pyrrhotite and chalcopyrite (company press release, October 2, 2001).

East West Resource Corporation and joint-venture partners **Canadian Golden Dragon Resources Ltd.** and **Avalon Ventures Ltd.** conducted further geological mapping, geophysical data interpretation, along with four additional, deep drill holes totaling 3156 m in the Seagull intrusion (a.k.a. Wolf Mountain). Earlier drilling had intersected 3.58 g/t platinum + palladium, 0.34% Cu, 0.21% Ni over 2.1 m. Down-hole and surface Pulse EM surveys followed by further drilling is anticipated (*London Mining Journal*, November 2001).

East West Resource Corporation and Canadian Golden Dragon Resources Ltd. are also exploring with **Teck Cominco Limited,** who have entered into an agreement on the Stop, Alwyn, Spruce River, Little Sturge and Hele properties. UTEM and magnetic geophysical surveys are planned (East West Resource Corporation, press release, January 21, 2002). Additional properties, such as Posh, Havoc, Pebble, and Plateau–Stawson–Fire lakes, have also experienced ongoing exploration activity.

Novawest Resources Inc. conducted exploration on then Nickel Royale (Nicopor) property located in the Schreiber greenstone belt. The previously known, mineralized body (3 by 91 m) was resampled; grab samples returned up to 6.32% Ni and 2.48% Cu and up to 0.84 g/t platinum + palladium + gold. A new body of sulphides, located 15 m south of the known zone, was discovered. It is up to 15 m thick and 100 m in length, and returned up to 2.72% Ni, 0.39% Cu. The FourSox property, 12 km to the west, marks the presumed extension of the horizon. Initial results of up to 0.23% Ni + Cu, and 168 ppb platinum + palladium were obtained there (*Canada Stockwatch*, January 03, 2002).

Prospectors **J. Kowalski** and **D. Kowalski**, prospecting in the Petry Lake area west of Graham, discovered deformed and altered, medium-grained, mafic intrusive rocks which assayed up to 854 ppb Pd, 52 ppb Pt and 41 ppb Au; additional samples assayed up to 1517 ppm Cu (Resident Geologist's Files, Thunder Bay South District, Thunder Bay). The Rambler showing displayed altered, anorthositic gabbro and deformed, talc-rich gabbro with fine-disseminated sulphides. In another location near Link Lake, a biotite-garnet-rich iron formation and gabbro were sampled and returned values of up to 2410 ppm Cu, 5271 ppm Zn, 1133 ppm Ni, 143 ppb Pd, 114 ppb Pt and 1648 ppm Cr (J. Kowalski, Prospector, personal communication, 2002).

Gold Exploration

In 2001, **Teck Cominco Limited** conducted exploration on their Stenlund, White River, Rous and Toothpick East properties in the Hemlo greenstone belt. Further diamond drilling was conducted in the

Heron Bay area, where a 7.3 m intersection of 9.3 g/t gold and 184 g/t silver was reported in 1999 (Teck Corporation, 1999 Annual Report).

Prospecting by **P. Moses** on the Smoke Lake property, northeast of Marathon, discovered additional, gold-mineralized float boulders, approximately 50 m west of Bond Lake. The sample of deformed and altered monzonite with approximately 5% disseminated pyrite returned 14.56 g/t gold (Peter Moses, Prospector, personal communication, 2002). The lack of quartz veins suggests that potential for larger-tonnage targets exists near the southern contact of a monzonite stock with the enclosing metavolcanic rocks (*see* "Recommendations for Exploration", this report).

Moss Lake Gold Mines Ltd. undertook a mapping and prospecting program on its Fountain Lake property in the Shebandowan greenstone belt. This work compliments geophysical surveys carried out earlier in the year. A new gold showing on the southwestern portion of the property returned 13.76 g/t gold, contained within a north-striking structure (company press release, November 28, 2001).

Base Metal Exploration

RJK Explorations Ltd. and **GLR Resources Inc.** sought a bedrock source of massive sulphide boulders on their Aldina Property (*see* "Property Examinations", this report). The companies had been conducting stripping, following back a 2 km train of glacial float, which included the Stares and Calvert boulders. A zone of disseminated to massive sulphide mineralization was discovered in June, 2001. Grab samples returned up to 10.04% Zn, 1.18% Pb, 0.23% Cu, 134 g/t silver and 0.68 g/t gold (company press release, July 3, 2001). Diamond drilling below the zone in hole MSD01-05 returned an intersection of 2.6 m grading 11.8% Zn, 0.05 % Pb, 0.03 % Cu, 109 g/t silver and 3.20 g/t gold (including a 1 m section grading 31.1% Zn, 0.07% Pb, 0.47% Cu, 188 g/t silver and 4.39 g/t gold (company press release, October 04, 2001). RJK and GLR are also planning to drill their Steel River property located 25 km east-northeast of Terrace Bay. Grab samples from the Starhill Zone assayed up to 10.4% Zn + Pb + Cu, 101 g/t silver and 0.87 g/t gold (RJK Explorations Ltd./Greater Lenora Resources Corp., news release, April 09, 2001). Drilling will test a 600 m long DEEP-EM anomaly.

Inco Limited, in joint-venture with **Atikokan Resources Inc.**, conducted line cutting, geological, geochemical and Pulse EM geophysical surveys on the Lumby Lake–Spoon Lake property. Diamond drilling is planned for the silver-rich, polymetallic occurrence in early 2002 (R. Bernatchez, Atikokan Resources Inc., personal communication, 2002)

Diamond Exploration

North Atlantic Nickel Corp. acquired property in the Marmion batholith, northeast of Atikokan, after conducting a 1000 km high-resolution, airborne magnetometer survey in June 2001 (company press release, July 5, 2001). Prospecting, mapping and stream sampling were slated for the summer of 2001.

Numerous prospectors continued to explore mafic to ultramafic dike rocks in the Marathon area. **R. Wahl** has garnered interest in his Heron Bay property, where he has discovered numerous mafic to ultramafic dikes and diatreme breccias. Some rocks have been tentatively identified as kimberlitic; they contain olivine and phlogopite (phenocrysts?), in a contained matrix of fine-grained phlogopite, olivine, spinel, perovskite, melilite, chromite and carbonate. Local intrusive rocks have yielded several chromite grains that plot within the diamond intergrowth and inclusion fields (World Wide Website, http://users.renegadeisp.com/~rwahl/).

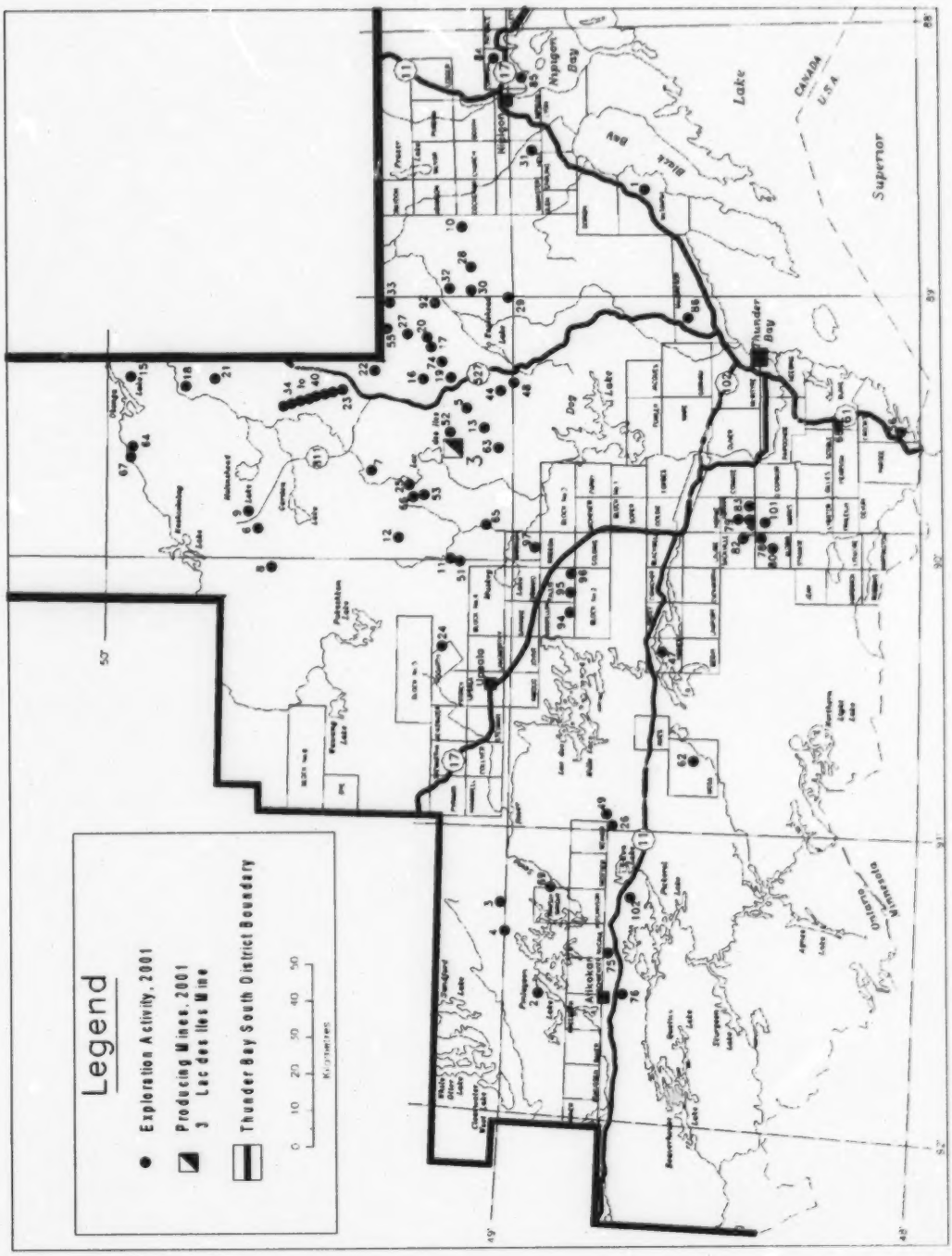

Figure 1. Thunder Bay South Resident Geologist's District (Western portion), exploration activity, 2001.

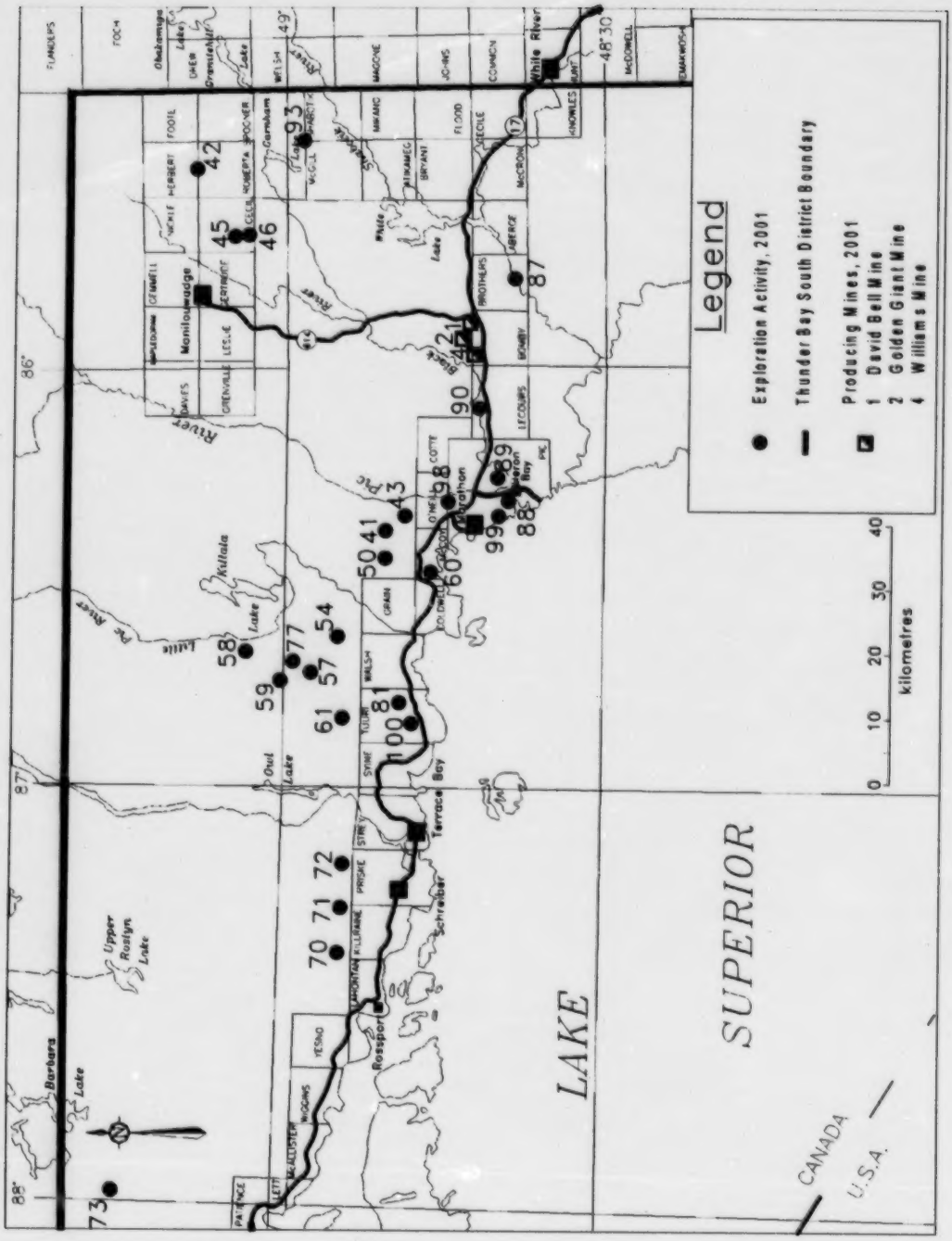
Legend
Exploration Activity, 2001
Thunder Bay South District Boundary
Producing Mines, 2001
1 David Bell Mine
2 Golden Giant Mine
4 Williams Mine
Kilometres
0 10 20 30 40
SUPERIOR
LAKE
CANADA
U.S.A.
Thunder Bay
Terrace Bay
Schreiber
Rossport
Marathon
White River
Manitouwadge
Upper Rostyn Lake
Kitiala Lake
Barbara Lake
Pic River
Pic
Long Lake
Gravel River
Gravel
Gravel
Gravel

Table 3. Exploration activity in the Thunder Bay South District in 2001 (keyed to Figures 1 and 2)

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
EnvR ..... Environmental Baseline Study
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP..... Induced polarization survey
Lc ..... Linecutting
Met..... Metallurgical testing
OD ..... Overburden drilling
ODH..... Overburden drill hole(s)
PEM ..... Pulse electromagnetic survey
PGM..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
1.	Anderson, C. (Amethyst)	McTavish Tp. (amethyst)	Str, Tr
2.	Atikokan Resources Inc. (Hardtack-Finlayson Lake Claim Group)	Finlayson Lake area (Cu, Zn)	Pr, GL, GC, Samp
3.	Atikokan Resources Inc. (Richardson Lake Block)	Richardson Lake area (Ag, Cu, Zn, Pb)	Lc, GL, GC, Str, GM, GEM
4.	Atikokan Resources Inc. / Inco Limited (Lumby Lake - Spoon Lake Property)	Norway Lake area (Ag, Cu, Zn, Pb)	Lc, PEM, GL, GC
5.	Avalon Ventures Ltd. / Starcore Resources Ltd. / Placer Dome (CLA) Limited (Legris Lake Property)	Shelby Lake and Whitefin Lake areas (PGE)	DD, Lc, GL, GC, IP
6.	Berland Resources Ltd. (Roaring River Property)	Gillard Lake area (PGE, Cu, Ni)	Pr, Samp, Lc, GL, GM, GEM, Str, GC
7.	Berland Resources Ltd. (Heaven Property)	Heaven Lake area (PGE, Cu, Ni)	
8.	Berland Resources Ltd. (Weaver Property)	Weaver Lake area (PGE, Cu, Ni)	Lc, GM, GEM
9.	Berland Resources Ltd. / Consolidated Westview Resource Corp. (Westview Option)	Gillard Lake area (PGE, Cu, Ni)	
10.	Bitterroot Resources Ltd. (Shillabeer Property)	Sprout Lake area and Cockeram Tp. (PGE)	GM, Grav
11.	Buck Lake Ventures Ltd. (Buck Lake Property)	Senga Lake area (PGE)	Str, Samp, GL, Tr, Pr, GC
12.	Buck Lake Ventures Ltd. / Pacific Topaz Resources Ltd. (Bo Lake Property)	Armistice Lake area (PGE)	Pr, Samp, Tr

	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
13.	Canadian Golden Dragon Resources Ltd. / Platinum Group Metals Ltd. (South Legris Property)	Lac des Iles, Max Lake, Shelby Lake, Whitefin lake areas (PGE, Cu, Ni)	GL, DD
14.	Candor Ventures Corp. (Twist Lake Property)	Adrian Tp. (Cu, Zn, Au)	GEM, GM
15.	Canplats Resources Corporation (Awl Property)	Obonga Lake area (PGE, Cu, Ni)	
16.	Canplats Resources Corporation (Circle Lake West)	Circle Lake area (PGE, Cu, Ni)	
17.	Canplats Resources Corporation (Circle Lake)	Circle Lake area (PGE, Cu, Ni)	
18.	Canplats Resources Corporation (Mount Property)	Pangloss Lake area (PGE, Cu, Ni)	Lc
19.	Canplats Resources Corporation / Platinum Group Metals Ltd. (Stucco Property)	Rightangle Lake and Circle Lake areas (PGE, Cu, Ni)	GC, geophysics, DD
20.	Canplats Resources Corporation (Boomer Lake)	Circle Lake area (PGE, Cu, Ni)	
21.	Canplats Resources Corporation (Voltaire-Johnspine Property)	Pangloss Lake, Candide Lake and Chief Bay areas (PGE, Cu, Ni)	GM, GEM, DD, GC, GL, Lc
22.	Canplats Resources Corporation / East West Resource Corporation (Posh Property)	Lunch Creek area (PGE)	IP, GL, GC, DD, GM, GEM
23.	Canplats Resources Corporation / Colby Resources Corp. (Geikie Property)	Cheeseman Lake, Kitchen Lake and Chief Bay areas (PGE, Cu, Ni)	IP, GC, DD, Lc, GM
24.	Classic Gold Resources Ltd. (Muise Lake Property)	Hogarth Lake area (Cu, Ni, PGE)	DD, Pr, Samp, LC, GM
25.	Classic Gold Resources Ltd. (Tib Lake Property)	Tib Lake area (Cu, Ni, PGE)	DD, Pr, Samp
26.	Denstone Ventures Ltd. / 1349563 Ontario Ltd. (North Elbow Lake Property)	Bedivere Lake area (PGE)	Pr, Samp, Str, GL, GM
27.	East West Resource Corporation / Teck Corporation (Alwyn Property)	Mikinak Lake area (PGE, Cu, Ni)	
28.	East West Resource Corporation / Teck Corporation (Stop Property)	Little Sturge Lake area (PGE, Cu, Ni)	
29.	East West Resource Corporation / Canadian Golden Dragon Resources Ltd. / Avalon Ventures Ltd. (Disraeli - Seagull Property (*a.k.a.* Wolf Mountain)	Leckie Lake area (PGE, Cu, Ni)	DD, GL
30.	East West Resource Corporation / Canadian Golden Dragon Resources Ltd. / Teck Corporation (Little Sturge Property)	Little Sturge Lake area (PGE, Cu, Ni)	Pr, Samp
31.	East West Resource Corporation / Canadian Golden Dragon Resources Ltd. / Teck Corporation (Hele Property)	Hele Tp. (PGE, Cu, Ni)	GL, GM (Remnant Mag.), IP, Lc
32.	East West Resources Corporation / Canadian Golden Dragon Resources Ltd./ Teck Corporation (Spruce River)	Little Sturge Lake area (PGE)	Pr, Samp

	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
33.	East West Resources Corporation / Colby Resources Corp. (Black Sturgeon East Property)	Black Sturgeon Lake area (Cu-Ni-PGE)	GM, IP, Lc
34.	Fairservice, R. (Badger Property)	Kitchen Lake area (PGE)	Pr, Samp
35.	Fairservice, R. (Bear Property)	Kitchen Lake area (PGE)	Pr, Samp
36.	Fairservice, R. (Creek Property)	Candide Lake area (PGE)	Pr, Samp
37.	Fairservice, R. (Fox Property)	Kitchen Lake area (PGE)	Pr, Samp
38.	Fairservice, R. (Gabbro Hill Property)	Candide Lake area (PGE)	Pr, Samp
39.	Fairservice, R. (Lynx Property)	Kitchen Lake area (PGE)	Pr, Samp, Str
40.	Fairservice, R. (Wolf Property)	Kitchen Lake area (PGE)	Pr, Samp
41.	Freewest Resources Canada Inc. (Bermuda Property)	Seeley Lake area (PGE)	Str, GL, Samp, IP
42.	Freewest Resources Canada Inc. (Moshkinabi Property)	Roberta and Herbert tps. (PGE, Cu, Ni)	Pr, Samp, Tr, GL
43.	Geomaque Explorations Ltd. / PolyMet Mining Corp. (Marathon Property)	Seeley Lake area (PGE, Cu, Ni)	DD, Str, Pr, Samp, GL, Lc
44.	Gilbert, W. & Gillis, D. (Block Creek Property)	Whitefin Lake and Max Lake areas (PGE)	Pr, Samp
45.	Gionet, G. and M. (Rawluk Lake Property)	Cecil Tp. (PGE, Cu, Ni)	Pr, Samp, Tr, Str, Beep
46.	Gionet, G. and M. (Faries Lake Property)	Cecil Tp. (Cu, Zn, Ni, PGE)	Pr, Samp, Tr, Str, Beep
47.	Hackl, J. and J. (Peninsula Property)	Haines Tp. (PGE, Cu, Ni)	Pr, Samp
48.	Hietapakka, R. and Stevens, D. (Fat Beagle Property)	Max Lake area (Au)	Pr, Samp
49.	Intrepid Minerals Corporation / Wallbridge Mining Corp. Ltd. (Lac des Mille Lacs Property)	Bedivere Lake area (PGE)	Pr, Samp, GL
50.	L.E.H. Ventures Ltd. / Gryphon Metals Corporation / Coubran Resources Ltd. (Geordie Lake Property)	Seeley Lake area (PGE)	DD, Met
51.	Lac des Iles Mines Ltd. (Buck Lake Property)	Tib Lake area (PGE)	GL, Pr, Str, Samp, GM, IP, Lc
52.	Lac des Iles Mines Ltd. (Lac des Iles Mine Property)	Lac des Iles area (PGE, Cu, Ni)	DD, GL, Str, Samp, Pr
53.	Lac des Iles Mines Ltd. (Tib Lake Property)	Tib Lake area (PGE)	GM, IP, Lc
54.	McVicar Minerals Ltd. / BHP World Exploration Inc. (Foxtrap Property)	Foxtrap Lake area (Cu-Ni-PGE)	Pr, Samp
55.	McVicar Minerals Ltd. / BHP World Exploration Inc. (Muskrat Property)	Little Sturge Lake area (PGE)	Pr, Samp, DD

	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
56.	McVicar Minerals Ltd. / BHP World Exploration Inc. / Falconbridge Limited (Pigeon River Property)	Pardee and Crooks tps. (Cu-Ni-PGE)	Pr, Samp, Agrav, GM
57.	Michano, D., Gionet, B. and Wahl, R. (Foxtrap Creek Property)	Foxtrap Lake and Killala Lake areas (diamonds, rare earth elements)	Pr, Samp
58.	Michano, D., Moses, P., Gionet, B. and Wahl, R. (Islington and Upper Deadhorse properties)	Foxtrap Lake and Killala Lake areas (diamonds, rare earth elements)	Pr, Samp
59.	Michano, D., Renner, R., Moses, P. and Wahl, R. (Dead Horse Creek Property)	Foxtrap Lake and Killala Lake areas (diamonds, rare earth elements)	Pr, Samp
60.	Morgan, J. (Coldwell Property)	Coldwell Tp. (Stone)	Pr, Samp, GRA, IM
61.	Moses, P. (Larry Lake Property)	Santoy Lake area (Cu, Zn, Au)	Pr, Samp
62.	Moss Lake Gold Mines Ltd. (Moss Lake Property)	Moss Tp. (Au)	GL, Samp, Pr, GM, VLFEM
63.	New Millennium Metals Corp. / East West Resource Corporation / Maple Minerals Ltd. (Shelby Lake-Lac des Iles River Property)	Shelby Lake area (PGE)	Tr, Pr, Samp, Str, DD, GM, IP, Lc
64.	New Millennium Metals Corp. / Canadian Golden Dragon Resources Ltd. (Ottertooth Property)	Obonga Lake area (PGE)	GL, Pr, Samp
65.	New Millennium Metals Corporation (Taman Lake Property)	Senga Lake area (PGE)	GL, Pr, Samp, Tr, Str
66.	New Millennium Metals Corporation (Tib Lake Property)	Tib Lake area (PGE)	Pr, Samp, GL
67.	New Millennium Metals Corporation / East West Resources Corp. (Ottertooth Property)	Whalen Lake and Puddy Lake areas (PGE)	Pr, Samp
68.	North Atlantic Nickel Corp. (Blake Property)	Blake, Devon and Pardee tps. (Cu, Ni, PGE)	DD
69.	North Atlantic Nickel Corp. (Marmion Property)	Bellmore Lake and Crooked Pine Lake areas (diamonds)	Pr, Samp
70.	Novawest Resources Inc. (FourSox Property)	Pays Plat Lake area (Cu, Ni, PGE)	GL, Pr, Samp
71.	Novawest Resources Inc. (Nickel Royale Property)	Pays Plat Lake and Lower Aguasabon Lake areas (Cu, Ni, PGE)	GL, Pr, Samp
72.	Novawest Resources Inc. (Shaboom Property)	(Au, Cu)	GL, Pr, Samp
73.	Platinova A/S (MNW Property)	Hanson Lake area (rare metals)	Pr, Samp
74.	Platinum Group Metals Ltd. / East West Resource Corporation (Pebble Property)	Circle Lake area (PGE)	GL, IP
75.	Prism Resources Inc. / Canplats Resources Corporation / East West Resource Corporation (Plateau Property)	McAlpine Lake area (PGE)	Lc, IP, GM
76.	Prism Resources Inc. / Canplats Resources Corporation / East West Resource Corporation (Stawson and Fire Lake Properties)	McOuat Lake area (PGE)	GL, Lc, IP, GM

	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
77.	Renner, R. and Wahl, R. (Foxtrap and Deadhorse properties)	Foxtrap Lake and Killala Lake areas (diamonds, rare earth elements)	Pr, Samp
78.	RJK Explorations Ltd. / GLR Resources Inc. (Stares-Calvert Property)	Aldina Tp. (Cu, Zn, Pb, Ag)	DD, Str, Tr, Samp, Lc, IP, GM, GL
79.	RJK Explorations Ltd. / GLR Resources Inc. (Rockstone Lake Property)	Adrian Tp. (Au, Cu, Zn)	DD
80.	RJK Explorations Ltd. / GLR Resources Inc. (Aldina South Property)	Aldina Tp. (Au, Cu, Zn)	Pr, Samp
81.	RJK Explorations Ltd. / GLR Resources Inc. (Steel River Property)	Tuuri Tp. (Au, Cu, Zn)	Pr, Samp, Recon
82.	RJK Explorations Ltd. / GLR Resources Inc. (Chataway Property)	Sackville Tp. (Au, Cu, Zn)	GC, Pr, Samp
83.	RJK Explorations Ltd. / GLR Resources Inc. (Adrian Lake Property)	Adrian Tp. (Au, Cu, Zn)	Str, Pr, Samp, IP
84.	Ruby Lake Marble Ltd. (Ruby Creek Property)	Corrigal Tp. (Stone)	Str, Samp, Pr, IM
85.	Ruby Lake Marble Ltd. (Ruby Lake Quarry)	Corrigal Tp. (Stone)	Str, Samp, Pr, IM
86.	Smith, B. (MacGregor Township Property)	MacGregor Tp. (Amethyst)	DD
87.	Teck Corporation (White River Property)	Laberge and Brothers tps. (Au)	DD, Tr
88.	Teck Corporation (Stenlund–Heron Bay Property)	Pic Tp. (Au)	DD
89.	Teck Corporation (Toothpick West Property)	Pic Tp. (Au)	DD
90.	Teck Corporation (Rous Lake Property)	Lecours Tp. (Au)	DD
91.	Teck Corporation / Saxony Explorations Ltd. (Goodchild Property)	Lorna Lake area (Au)	Pr, Samp
92.	Teck Corporation / East West Resource Corporation (Alwyn Property)	Mikinak Lake area ((PGE, Cu, Ni)	
93.	Ternowesky, J. (Bulldozer Lake Property)	Shabotik River area (PGE)	Pr, Samp
94.	Valerie Gold Resources Ltd. / East West Resource Corporation (Goodfellow Property)	Argon Lake area (PGE)	GM, IP, Lc
95.	Valerie Gold Resources Ltd. / East West Resource Corporation (Fallis Property)	Argon Lake area (PGE)	GM, IP, Lc
96.	Valerie Gold Resources Ltd. / East West Resource Corporation (Fallis Extension Property)	Argon Lake area (PGE)	GM, IP, Lc
97.	Valerie Gold Resources Ltd. / East West Resource Corporation (Orbit Property)	Orbit Lake area (PGE)	GL, Samp, Pr
98.	Voyager Explorations Limited (Pic Property)	Pic Tp. (PGE)	Pr, Samp, GL

	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
99.	Wahl, R. and Kusserow, G. (Heron Bay Property)	Pic Tp. (diamonds)	Pr, Samp, GC
100.	Wahl, R. and Renner, R. (Spider Lake Property)	Tuuri Tp. (Au)	Pr, Samp
101.	Whalen Resources Ltd. (Marks Township Property)	Marks Tp. (Cu, Zn, Au)	Tr
102.	Wolfden Resources Inc. / Jonpol Explorations Ltd. (Sapawe Property)	Pickerel Lake (North) area and Hutchinson Tp. (PGE, Au)	GL, GM, DD, Pr, Samp

RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES

The Thunder Bay South District is staffed by B.R. Schnieders, Regional Resident Geologist, J.F. Scott and M.C. Smyk, District Geologists and M.S. O'Brien, Regional Support Geologist. B.R. Schnieders took on a temporary (acting) position as the Regional Manager, Northwest Region, for the last six months of 2001. J.F. Scott acted as the Regional Resident Geologist for Thunder Bay North for May and June, and as the Regional Resident Geologist for Thunder Bay South for July and August. M.C. Smyk acted as the Regional Resident Geologist for Thunder Bay South District for the last four months of 2001. J. Stewart took an acting role as the Regional Support Geologist, and M.S. O'Brien was seconded as the Regional Mineral Development Consultant from May until December, 2001. D. Parker was hired as the Thunder Bay South District Geologist from June until December, 2001.

The Thunder Bay South Resident Geologist Program (RGP) dealt with more than 3700 inquiries from the mining sector, other government agencies and the general public. Bi-weekly visits were made to the Marathon satellite office from May until October, usually on Tuesday afternoons. Service was also provided to clients in the Thunder Bay Drill Core Library, as well as remote core storage facilities in Conmee Township (30 km west of Thunder Bay) and in Marathon.

RGP staff conducted 91 property visits to 48 properties in 2001 (Table 4). Eleven field trips were conducted or attended. Four posters displays were assembled and manned at the Cordilleran Round-Up held in Vancouver, B.C., the Prospectors and Developers Association of Canada convention in Toronto, the Northwestern Ontario Mines and Minerals Symposium in Thunder Bay and various open houses and conferences. Six technical presentations were delivered. Logistical support and field assistance were given to Ontario Geological Survey geoscientists conducting field work in the Thunder Bay South District.

R. Tuomi, Data Compilation Geologist, Thunder Bay, and RGP staff compiled and edited 13 Mineral Deposit Inventory (MDI) records in 2001, as well as worked on the RG Website and posted data including exploration activity and recommendations on that site. R. Tuomi also worked on preparing digital maps for the Website. D. Parker spent time streamlining the Provincially Significant Mineral Potential (PSMP) methodology and compilation process, and RGP staff assisted in PSMP evaluations and methodology.

B.R. Schnieders and J.K. Mason attended the 2001 Cordilleran Round-Up held in Vancouver B.C. A booth filled with rock samples, cut and polished rock slabs and drill core, display material, handouts, recommendations, and promotional materials, was manned. Commodities such as PGE, diamonds, rare metals, base metals, and gold, as well as Operation Treasure Hunt products, were highlighted.

M.C. Smyk, M.S. O'Brien and D. Parker were part of the planning committee for the Superior PGE 2001 hosted by the Thunder Bay Branch of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) and CIM Geological Society. B.R. Schneiders, M.C. Smyk, J.F. Scott and D. Parker presented technical

talks as well as assisted with field trips and logistics. M.C. Smyk and J. Stewart attended the Institute on Lake Superior Geology (ILSG) meeting, and M.C. Smyk is on the Regional Committee for the proposed Lake Superior National Marine Conservation Area (NMCA). J.F. Scott was actively involved with the application of Global Positioning System (GPS) technology (e.g., property, road, detailed grid, stripped area, and air photo base maps), as well as PSMP maps and GIS information. RGP staff assisted with the Superior PGE, ILSG, Northwestern Ontario Mines and Minerals Symposium, Cordilleran Round-Up and the PDAC Convention, just to name a few.

Table 4. Property visits conducted by the Thunder Bay South Regional Resident Geologist Staff in 2001.

Number	Property / Occurrence
1.	Aldina Township (Calvert-Stares) [PE]
2.	Aldina Township (Stewart)
3.	Arrow River
4.	Badger Mine
5.	Band Ore Lamprophyre
6.	Bateman Lake
7.	Blueberry Amethyst (Marks Township)
8.	Blueberry Amethyst (Oliver Township)
9.	Brink Pegmatite
10.	Buck Lake
11.	Burchell Lake (North Coldstream Mine)
12.	Caland Mine
13.	Coldwell Complex [FT]
14.	Dorion Mine
15.	Driftstone Lake
16.	Enterprise Mine
17.	Eva Lake [FT]
18.	Good Morning Lakes Fault [RE]
19.	Great Lakes Nickel [FT]
20.	Hele Township
21.	Ice Cream Lake
22.	Jarvis Island
23.	JR Occurrence (North Elbow) [PE]
24.	Keetch Amethyst [PE]
25.	Keystone Mine
26.	Lac des Iles Mine
27.	Larry Lake
28.	MacGregor Township
29.	Malborne Lake
30.	Marathon Deposit [FT]
31.	McQuaig Float
32.	Moshkinabi Lake
33.	Mt. Mollie [FT]
34.	Muskrat Lake
35.	Nickleby Lake [FT]
36.	Nipigon Bay (LaGrange, Vert, Simpson islands; Kama Bay)
37.	North Elbow Lake [PE]
38.	Pearl Lake Amethyst Mine
39.	Prince Mine
40.	Rita Bolduc [FT]
41.	Roaring River [PE]

Number	Property / Occurrence
42.	Roland Lake
43.	Ruby Lake Quarry [FT]
44.	Shebandowan Mine [FT]
45.	Sibley Group [FT]
46.	South McKellar Island
47.	Spar Island
48.	Steep Rock Iron Mine

[RE] *described in "RECOMMENDATIONS FOR EXPLORATION", this report*

[PE] *described in "PROPERTY EXAMINATIONS", this report*

[FT] *visited during field trip conducted by Resident Geologist's staff in 2001*

PROPERTY EXAMINATIONS

Stares/Calvert Property, Aldina Township

Base metal-bearing, massive sulphide mineralization has been recently recognized along the southern margin of the Shebandowan greenstone belt in Aldina Township, approximately 45 km west of Thunder Bay. The Stares/Calvert property is under option to GLR Resources Inc. and RJK Explorations Ltd. (World Wide Website, http://www.kasnergroupco.com). The property has been the focus of intensive exploration since the discovery of large (up to 15 t), polymetallic, massive sulphide boulders (Lavigne and Scott 1996; Schnieders et al. 2001). The discovery of additional mineralized boulders in overburden trenches in May 2001 marked the northern end of a 2 km long float dispersal train and suggested a proximal bedrock source (company news release, May 24, 2001). Subsequent overburden stripping nearby led to the discovery of massive sulphide-mineralized bedrock (company news release, June 25, 2001). Initial sampling consisted of 10 grab and chip samples from a blasted trench across approximately 10 m of sulphide-mineralized bedrock, returning the following results:

Sample No.	Au (g/t)	Ag (g/t)	Cd (ppm)	Cu (ppm)	Pb (ppm)	Zn (%)
28908	0.68	134.0	62	2290	11800	3.32
28909	0.36	84.0	86	1520	4740	4.25
28910	0.07	19.3	134	2080	218	5.29
28911	0.11	19.7	205	970	761	8.81
28912	0.16	10.5	122	899	109	4.92
28913	Nil	19.5	127	1560	351	4.03
28914	0.13	16.3	240	956	197	10.04
28915	0.16	21.3	68	2020	230	2.27
28916	Nil	10.6	170	1090	99	3.77
28917	0.31	17.7	218	2110	108	7.42

(company news release, July 3, 2001).

Resident Geologist staff visited the newly exposed occurrence (UTM Zone 16 (NAD 27), 5264870 N, 283191E) on June 25, 2001. A chip sample across 6.5 m of massive sulphide-mineralized, felsic metavolcanic rocks (Figure 3) returned the following assays:

Sample No.	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (%)
01 BAL-01	54	13	465	521	2.44

(Resident Geologist's Files, Thunder Bay South District, Thunder Bay)

The massive sulphide zone is flanked by a sericitic, quartz-feldspar porphyry unit (on the structural footwall) and argillaceous, cherty and banded pyritiferous units (on the structural hanging wall). Rocks are foliated at 288/80 N and display steeply plunging (~80° west) mineral lineations. The quartz-feldspar-phyric unit appears fragmental (tuffaceous?) in places, but locally seems to crosscut the sulphide zone; it is much more sericitized near the mineralized zone and contains massive pyrite bands, fragments and lenses. All felsic and sedimentary rocks are crosscut by mafic dikes and sills. Minor folds and sigmoidal, recrystallized, quartz-rich clasts in massive pyrite also attest to a high degree of deformation.

The massive sulphide zone consists largely of medium-grained pyrite with finer-grained sphalerite, porphyroblastic galena and minor chalcopyrite. A discontinuous, thin gossan is developed over the zone; only the pyrite- and sericite-rich lenses are recessively weathered. A sphalerite-rich lens, approximately 5 m in diameter, appears to grade laterally into pyritic and sericitic rocks. Argillaceous fragments were noted in the massive pyrite near the hanging wall contact. The podiform nature of the polymetallic sulphides suggests that they may be localized and/or zoned due to folding and remobilization.

These observations are consistent with those made elsewhere on the property and suggest that local sulphide deposits can be ascribed to volcanogenic massive sulphide (VMS) mineralization and subsequent tectonic modification (Schnieders et al. 2001). The key points supporting this contention were presented by J. Franklin on the basis of field observations and drill core examination in a company news release:

> [The property has:]
>
> - A well-developed felsic assemblage capped by a laterally extensive, thin unit of graphitic shale. This is an ideal sequence for the formation of VMS deposits a semi-permeable felsic host sequence that is capped by an impermeable shale unit. This type of sequence is present in almost all VMS districts.
> - A synvolcanic fault system, identified by talus breccia and occupied by synvolcanic, felsic intrusions. Such faults are ideal fluid conduits.
> - Sulphides that formed by the replacement of tuff or lapilli tuff as noted in the boulders are likely syngenetic and resemble other shallow water VMS systems however, the boulders and trench samples have only marginal Na depletion. This style of sub-sea floor mineralization is typical of many VMS districts, including some of the largest (e.g. Kidd Creek) and has also been observed in modern hydrothermal centres (e.g. Middle Valley, northwestern Pacific).
> - Strong, steeply plunging, linear structural elements, possibly indicating tectonic transport of the sulphides.
> - Mafic/ultramafic intrusions (sills) in the footwall that are possibly the manifestation of a major, subvolcanic intrusive system, critical as a heat supply for the region.
>
> Franklin also suggested that the lack of sodium depletion is typical in many deformed VMS districts where sulphide bodies are tectonically transported away from their feeder zones. Examples of this include the Lyon Lake and Creek Zone deposits at Sturgeon Lake, Ontario. The Fox mine in the Lynn Lake Region, Manitoba is a good example of a deposit that was deformed into a steeply plunging rod where alteration was confined to the center of the rod and not strongly evident in outcrop.

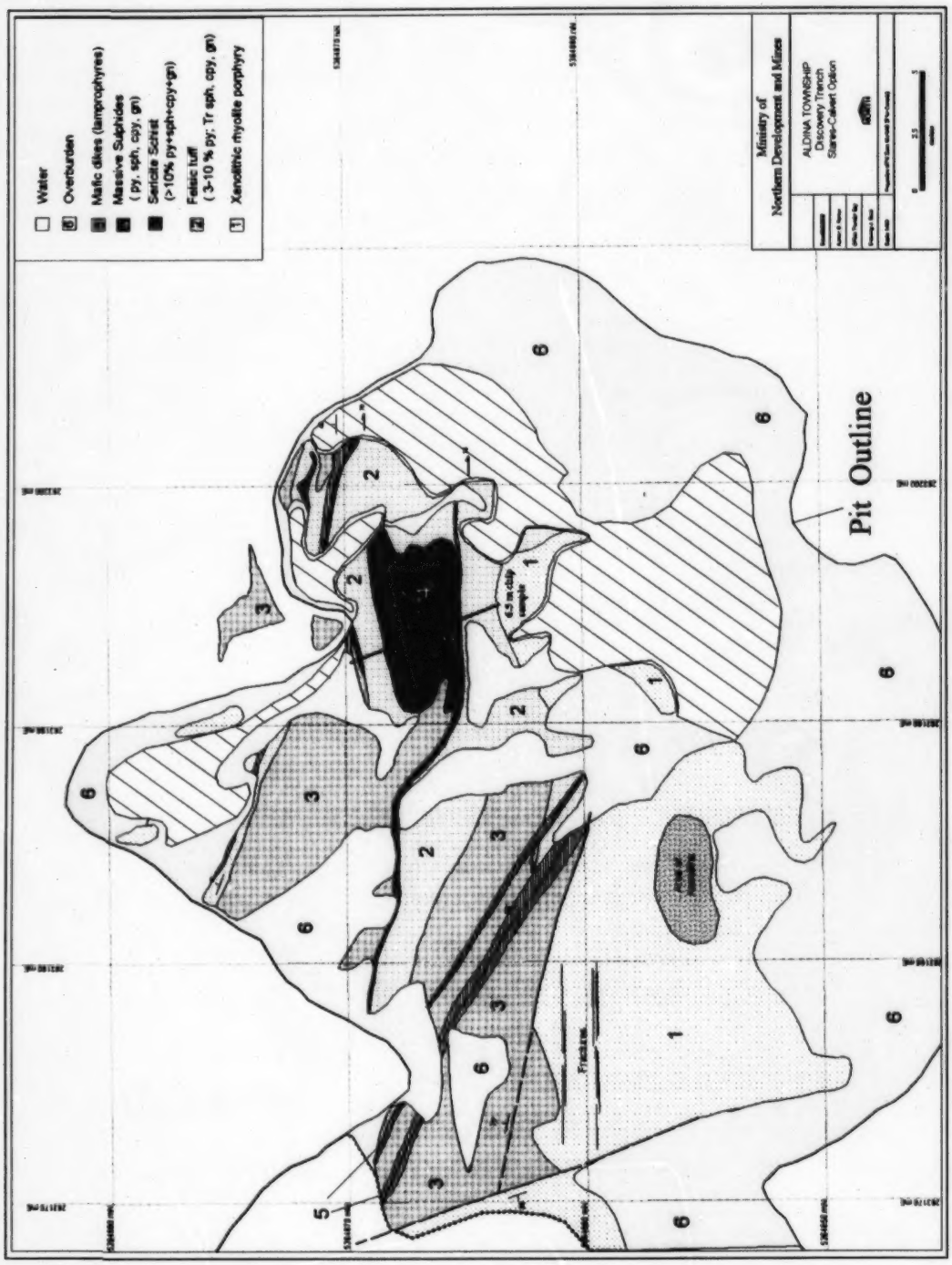

Figure 3. Geology of the newly discovered massive sulphide occurrence, Stares/Calvert property.

Based on the current data and knowledge, a deformed syngenetic model is favoured, with the deposit likely to be rod-shaped with a steep north-northwesterly plunge. This type of mineralization may be confined to as little as 100 m, but may be vertically extensive.

The Companies believe that with the current discovery, the source of the mineralized debris is proximal to the basal till sampling pit and beneath or at the graphitic shale sedimentary cap located approximately 100 m to the north.

As overburden depths are generally less than 8 m, an extensive program of mechanical stripping will begin to obtain accurate structural information and potentially locate bedrock source of the boulder train. Management believes that the probability of finding the source is excellent.

The Companies own or control through various option arrangements a 75 km^2 land package covering favourable VMS-type geology. Several untested airborne input EM anomalies lie within this land position and are considered additional high potential VMS targets.

(company news release, May 24, 2001)

In 2001, drill holes MS01-33, 34 and 35 were targeted below the uncovered massive sulphide zone. Drill hole MS01-33 was completed on section 2039 west, 430 north, -45° and intersected a zone of polymetallic sulphides at approximately 15 m below surface. All samples were taken over 1 m intervals and returned weighted grades of:

Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Length (m)
0.41	41.7	0.07	0.23	2.52	7.0

Drill hole MS01-34 was drilled at -60° from the same location and intersected sulphide mineralization at approximately 35 m below surface. This hole returned weighted grades of:

Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Length (m)
1.38	170.9	0.05	0.86	2.27	8.0
Including:					
2.55	286.4	0.06	1.62	4.0	4.0

Drill hole MS01-35 was drilled on the section 2039 west, 460 north, -45° and encountered sulphides approximately 50 m below surface. This hole returned anomalous metal values only (company news release, September 26, 2001).

Drill holes MSD01-04 and MSD01-05 were drilled on section 2029 west 430 and 440 north, respectively, and intersected sulphides approximately 15 and 30 m below surface which contained the following values:

MSD01-04:

Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Length (m)
1.0	98.1	0.11	0.64	4.91	3.0

MSD01-05:

Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Length (m)
3.20	109.0	0.03	0.05	11.8	2.6
Including:					
4.39	188.0	0.47	0.07	31.1	1.0

(company news release, October 3, 2001)

A Company news release (December 11, 2001) stated that RJK Explorations Ltd. and GLR Resources Inc. had completed 18 diamond drill holes on the property in the polymetallic sulphide discovery area. The current phase of drilling had outlined a zinc-rich occurrence and had defined and tested the mineralized, bedded felsic tuff horizon along strike to the east to relatively shallow depths. Lithogeochemical analysis

of drill core samples from this program were completed to better understand alteration signatures which may provide new targets at depth and along this unit. In addition, a soil sampling program utilizing enzyme leach over the main felsic unit had been initiated. Soil sampling from the discovery area was completed for reference purposes. Results indicated an extensive, partially defined base metal soil anomaly located approximately 1600 m west of the discovery area. These areas will be the focus of additional drilling once the sampling and analytical programs are completed.

The companies have also initiated exploration in other areas of their large, contiguous land holdings, including the Adrian Lake, Chataway and Aldina South properties (ibid.).

Amethyst Occurrences in the Ancliff Area

A number of amethyst-bearing veins occur in the Ancliff area, in the northeastern part of McTavish Township, approximately 50 km northeast of Thunder Bay (Figure 4). Archean felsic plutonic basement is unconformably overlain by sedimentary rocks of the Mesoproterozoic Sibley Group (McIlwaine 1971). Amethyst occurs within lead-zinc-bearing, quartz-carbonate veins (a.k.a. "lead-zinc-barite veins"; Franklin and Mitchell 1977) within structures at, or near, the unconformity. Descriptions of these occurrences have most recently been completed by Garland (1994).

The Keetch amethyst deposit (UTM Zone 16 (NAD 27) 5393216N, 381210E) occurs in a fracture zone that strikes 065° and dips steeply to vertically. It is hosted by brick-red, flat-lying Rossport Formation (Sibley Group) siltstone. In the vicinity of the amethyst-bearing veins, the siltstone has been variably silicified, sulphidized and/or hematitized. Altered siltstone is commonly beige or green. Although the granitic basement is exposed approximately 30 m to the north of the main pit, the unconformity is not exposed. Granite xenoliths are not readily visible in the vein breccias. Granite is also exposed a few hundred metres to the southeast; the unconformity, displaying basal breccia on weathered, brecciated granitic basement, is exposed on the Canadian National Railway at this location (UTM Zone 16 (NAD 27) 5393078N, 381437E). The narrow distribution of the Sibley Group rocks suggests that the siltstones occupy either a paleodepression in the basement or a fault-bounded, down-dropped block.

In the main pit, two predominant amethyst-bearing veins bracket a 2 m wide fracture zone. They have been traced along strike, under a muck pile, to the southwest. They are best exposed in the west wall of the 3 to 4 m deep pit, whose bottom lies below the water table. The northern vein is crustiform and vuggy, with white quartz margins giving way to amethystine and clay-rich cores. This vein averages 15 to 20 cm in width, but locally "blows out" to 35 cm. Many of the crystal tips have been sheared off and are found loose in the unconsolidated clay in the vugs. Accessory minerals include sphalerite, galena, chalcopyrite, pyrite, arsenopyrite, barite, calcite, fluorite and bright green chlorite. Massive pyrite occurs in patches on the north face of the pit. Amethyst may grade laterally into what has been termed "black gem", a fine-grained, black quartz.

The Ted Stone occurrence (UTM Zone 16 (NAD 27) 5393281N, 381320E) lies approximately 100 m northeast of the main pit and also occupies a fracture system in granite striking 065° and dipping 70° to the south. The veins and the matrix- to clast-supported vein breccias contain abundant galena and granite and Sibley Group rock fragments.

The Ancliff (Chuck Anderson) occurrence lies on the western side of the Trans Canada Pipelines right-of-way (UTM Zone 16 (NAD 27) 5395317N, 382299E). A parallel fracture zone is exposed over approximately 10 m and is oriented at 225/70N. The individual veins vary in width from <1 to 20 cm. They are dominantly white, locally amethystine quartz veins and vein breccias, hosted by red to buff-coloured Rossport siltstone. Some of the veins contain crustiform, drusy barite and disseminated, fine-grained chalcopyrite.

The Ancliff Station amethyst occurrence was discovered by C. Anderson in 2001, north of the Superior Shores Road. An interesting feature of this occurrence is the presence of subhedral, pale green to

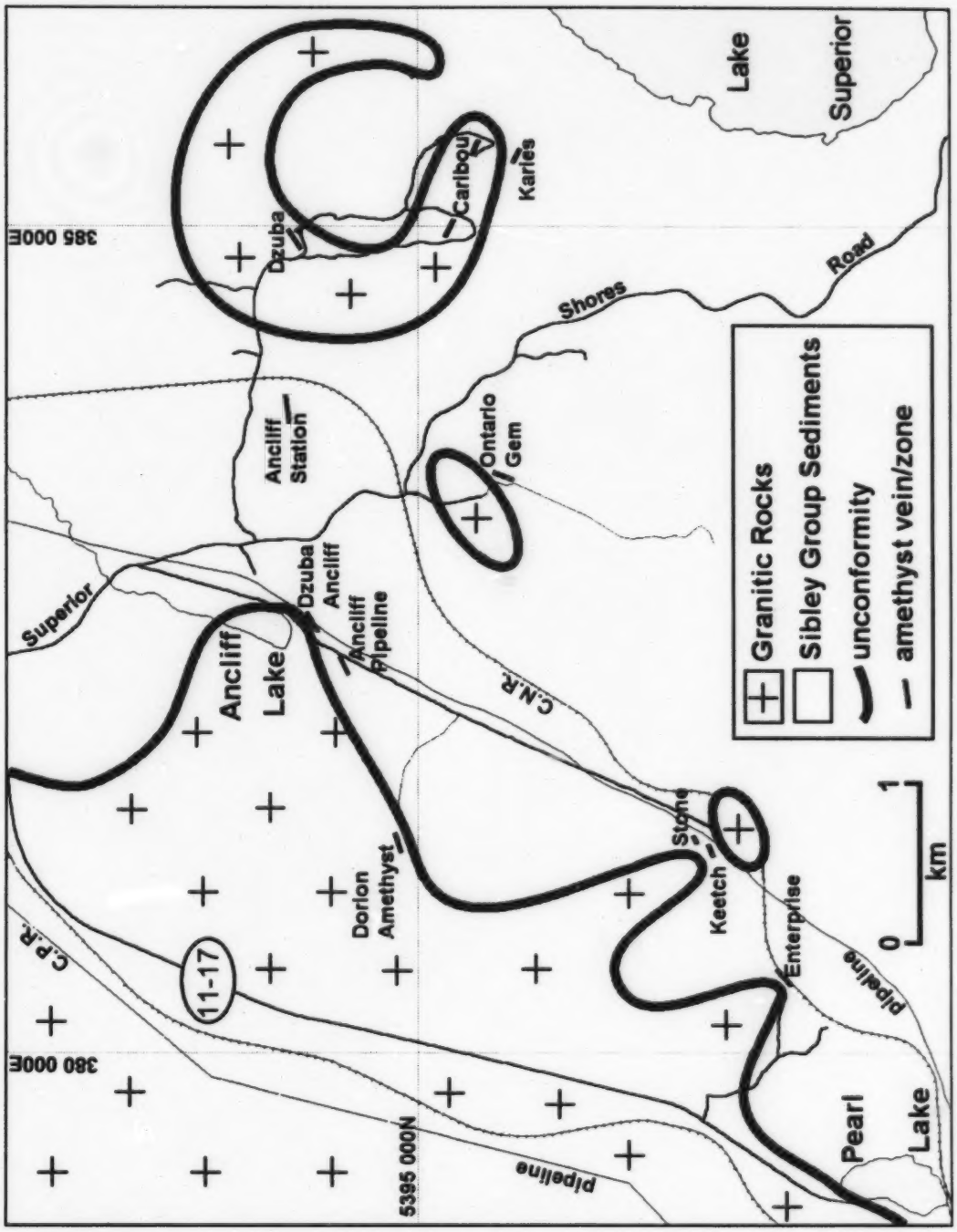

Figure 4. Amethyst occurrences in the Ancliff area.

tan, translucent barite crystals up to 2 cm long, as identified by X-Ray diffraction (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

North Elbow Lake Property

The North Elbow Lake Property is located approximately 140 km west of Thunder Bay and 45 km east of Atikokan, Ontario. The North Elbow Lake intrusion, which underlies the central portion of the property, is one of a cluster of five, closely spaced intrusions in the immediate vicinity. It is one of the Quetico intrusions, a group of Archean, mafic to ultramafic, hornblende-rich intrusions typically occurring between the margin of the Quetico batholithic complex and the Quetico fault, east and west of Atikokan (MacTavish 1992, 1999). Intrusions, ranging from diorite to peridotite, commonly host disseminated sulphide zones containing significant values of platinum group elements (PGE), copper, nickel, gold and/or cobalt (ibid.). These intrusions produce strong, distinct aeromagnetic anomalies, especially when they are hosted by metasedimentary rocks.

Pirie (1978) noted that the Elbow Lake mafic intrusive complex (which comprises the North and South Elbow Lake stocks and associated dikes) consisted of hornblendite, minor pyroxenite, feldspathic hornblendite, hornblende gabbro and diorite. The North Elbow Lake stock is approximately 1.5 km in diameter and has intruded Quetico Subprovince clastic metasedimentary rocks, chiefly turbiditic wacke and mudstone and derived schist and phyllite (ibid.).

The JR occurrence (UTM Zone 15N (NAD 27) 5403061N, 645810E) was discovered by prospectors J. Pinksen and R. Varrin working for 1349563 Ontario Ltd. in the North Elbow Lake area in the fall of 2000. Preliminary assays from grab samples returned up to 5 g/t platinum, 1.5 g/t palladium, 3.73% Cu and 0.6% Ni from hornblendite, gabbro and pyroxenite (A. Eveleigh, Eveleigh Geological Consulting, personal communication, 2001). Denstone Ventures Ltd. was granted an option to acquire a 50% interest in the property (Denstone Ventures Ltd., news release, February 5, 2001). Late in the 2000 field season, a $50 000 work program was conducted, consisting of prospecting, limited outcrop stripping and washing, followed by surface grab sampling of mineralized gabbroic rocks (Denstone Ventures Ltd., news release, May 7, 2001). Twenty one grab samples taken over an area 25 by 25 m averaged 1.90 g/t platinum + palladium; the ratio of platinum to palladium is approximately 2:1 (ibid.).

A program of prospecting, geological mapping and ground magnetometer geophysics was initiated in May 2001 to expand the exposure of the JR occurrence. Stripping revealed that the occurrence was hosted by a mafic to ultramafic dike, extending southwest off the main North Elbow Lake Intrusion (Denstone Ventures Ltd., news release, June 27, 2001). The 2001 sampling program on other areas of the JR showing also confirmed grades similar to the previous program, returning values between 1.08 g/t platinum + palladium (0.524 g/t platinum, 0.560 g/t palladium) and 4.27 g/t platinum + palladium (2.07 g/t platinum, 2.20 g/t palladium). Denstone completed a 35 km ground magnetometer survey which has defined a magnetic high anomaly with a minimum strike length of 800 m. This anomaly is believed to represent the strike extension of the mineralized dike, trending in a northeast-southwest orientation (ibid.).

The JR occurrence is situated on the northwestern margin of a 35 to 40 m wide, hornblende-megacrystic gabbro-hornblendite dike that has intruded locally folded wacke-siltstone country rocks. Although the clastic sedimentary rocks have been metamorphosed to biotite-amphibole-quartz schists, relict flame structures and graded beds are preserved and indicate a northerly younging direction at this location. Sedimentary rocks along the southeastern contact display tight folds with shallow, westerly plunging fold hinges. The northwestern contact is sharp, trends 050°, and shows no evidence of chilling, except for a lack of hornblende megacrysts. These megacrysts, up to 2 cm long, tend to be altered to secondary biotite and weather recessively, producing a pitted outcrop surface. Gossanous zones tend to cluster at or near the contact. The JR occurrence consists of rusty, non-magnetic, medium- to coarse-grained hornblendite with ≤4% disseminated to blebby chalcopyrite + pyrite; some sulphide coatings occur along fractures. There is a weak to moderate reaction to dimethylglyoxime.

The mafic and ultramafic rocks are crosscut by boudinaged quartz veins, as well as a variety of felsic dikes, ranging from aplite to tonalite. Appinitic pegmatite pods were also noted. An enigmatic breccia occurs along the dike contact to the southwest. It consists of subrounded to flattened, folded white quartz (vein?) fragments in hornblende gabbro.

The stripped areas continue around Max Lake, northeast of the main stripped area, centered on the JR occurrence. Another gabbroic dike, 3 to 4 m wide, trending 060°, is exposed on the northeastern shore of Max Lake.

Rusty zones and sulphides are apparently localized by contact zones, shear zones, dikes and dike contacts and fractures. Grab sampling of a number of sulphide occurrences and mafic to ultramafic host rocks by Resident Geologist staff returned the following assays:

Sample Number	Location (UTM Coordinates)	Au (ppb)	Cu (ppm)	Ni (ppm)	Pd (ppb)	Pt (ppb)	Zn (ppm)
01 BJR-01	JR Showing (North Elbow); Original (Discovery) outcrop, Main Stripped Area (5403061N, 645810E)	28.09	5697	1016	542.57	999.1	130
01 BJR-02	JR Showing (North Elbow); Main Stripped Area	17.14	2219	3004	280.52	11.99	87
01 BJR-03	JR Showing (North Elbow); Main Stripped Area	46.31	8403	397	230.59	771.5	88
01 BJR-04	JR Showing (North Elbow); "6 g/t" showing; Main Stripped Area	26.29	4018	752	210.86	1138	64
01 BJR-05	JR Showing (North Elbow); southern contact of dike; Main Stripped Area	10.66	2803	549	327.35	201.1	70
01 BJR-06	JR Showing (North Elbow); trenched area, northeast of Max Lake	N.D.	189	99	N.D.	8.33	80
01 BNE-01	North Elbow Lake Intrusion south side of road (5402396N, 647813E)	N.D.	164	114	N.D.	N.D.	84
01 BNE-02	North Elbow Lake Intrusion (5402396N, 647813E); north side of road	N.D.	97	143	N.D.	N.D.	87

N.D.= not detected

Roaring River Property

The Roaring River Property lies approximately 140 km north-northwest of Thunder Bay, 60 km north of the Lac des Iles Mine. It is accessed via the Garden Lake road (Highway 811) which crosses the south end of the claim group.

Following staking by prospectors M. and S. Stares in March 2000, Berland Resources Ltd. acquired an option to purchase a 100% interest in the property from Stares Contracting Corp. Berland Resources also acquired three satellite PGE properties: the Westview option, the Weaver property and the Heaven property (Berland Resources Ltd., World Wide Website, http://www.berlandresources.com).

Prospecting on the Roaring River property in 2000 led to the discovery of the North Boulder occurrence. At the Mere showing, assays of up to 1249 ppm Ni, 3159 ppm Cu and 1.1 g/t platinum + palladium + gold

were reported, and at the Leigh (boulder) occurrence, up to 2067 ppm Ni, 1920 ppm Cu and 1.23 g/t platinum + palladium + gold were reported from grab samples (company press release, December 6, 2000). Exploration in 2001 included prospecting, linecutting, mapping, rock and soil sampling, trenching and mechanized stripping, as well as additional claim staking (Berland Resources Ltd., World Wide Website, http://www.berlandresources.com).

The property is underlain by the Neoarchean Roaring River complex, a crescent-shaped intrusion 70 km long and 1 to 15 km wide (Stern and Hanson 1991). It consists of a variety of plutonic rocks, including diorite, monzodiorite, monzonite, quartz monzodiorite and granodiorite, all of sanukitoid affinity; gabbroic and pyroxenitic rocks are found as mega-inclusions in these aforementioned phases (ibid.). The property, covering the area of highest magnetic intensity of the intrusive complex, is underlain predominantly by poorly exposed gabbroic rocks (referred to as the "Highway 811" gabbro by Stern and Hanson 1991). Mesoproterozoic diabase intrudes the Archean plutonic rocks.

The Leigh showing (UTM coordinates 16U 0291673/5500258) consists of numerous mineralized boulders whose size, angularity and similarity suggest local derivation from bedrock. The predominant rock type is a coarse-grained, equigranular, hornblende monzogabbro with approximately equal proportions of hornblende and pink feldspar. There are no visible xenoliths nor dikes. Accessory biotite may be the result of incipient alteration of the hornblende. Thin section petrography reveals that the gabbro contains both plagioclase and alkali feldspar. The feldspars are incipiently replaced by sericite, carbonates and epidote. Other minerals include actinolite, apatite and titanite (C. Vaillancourt, Ontario Geological Survey, personal communication, 2001). The rock is weakly to moderately magnetic, especially near sulphide blebs that produce rusty weathered patches on the outcrop surfaces. Blebby pyrite and lesser chalcopyrite (± malachite) and pyrrhotite are uniformly disseminated in amounts locally approaching 5%. There is a strong reaction to dimethylglyoxime.

The Leigh North showing consists of a moderately magnetic, medium- to coarse-grained, hornblende gabbro to hornblendite with leucocratic pegmatite veins. Appinitic pods were also noted. Fine-grained, disseminated, interstitial to blebby sulphides typically occur in amounts up to 1%. Previous grab sampling had returned >1 g/t combined platinum + palladium (B. McCrindle, Berland Resources Ltd., personal communication, 2001).

The Mere showing is situated approximately 2 km north of the Leigh showings, just south of the Garden Lake Road. The host rock is predominantly equigranular hornblendite to coarse-grained, hornblende leuco- and melagabbro, locally cut by reticulate leucogabbro pegmatite veins and hornblendite dikes. The pink feldspars are typically recessively weathered. The initial discovery was facilitated by a prominent gossanous face on a large outcrop knob in a relatively flat, sandy outwash plain. Weakly magnetic, fine-grained disseminated sulphides may reach 1%. Scattered clots of magnetite + epidote + secondary amphibole were also noted.

Grab sampling of these three showings by Resident Geologist staff returned the following assays:

Sample Number	Location (UTM Coordinates*)	Au (ppb)	Cu (ppm)	Ni (ppm)	Pd (ppb)	Pt (ppb)	Zn (ppm)
01 BRR-01	Leigh Showing (291673E / 5500256N)	21.48	664	1176	555.68	98.48	70
01 BRR-02	Leigh Showing (291673E / 5500256N)	23.93	879	905	293.23	46.98	124
01 BRR-03	Leigh North (291683E / 5500395N)	7.25	203	384	81.22	43.89	67
01 BRR-04	Leigh North (291683E, 5500395N)	19.57	382	231	147.53	123.5	45
01 BRR-05	Mere Showing (292544E, 5502235N)	103.4	1293	493	385.89	112.5	58

Sample Number	Location (UTM Coordinates*)	Au (ppb)	Cu (ppm)	Ni (ppm)	Pd (ppb)	Pt (ppb)	Zn (ppm)
01 BRR-06	Mere Showing (292544E, 5502235N)	85.45	1708	436	316.78	110.3	43

*(*NAD 1927, UTM Zone 16N; Resident Geologist's Files, Thunder Bay South District, Thunder Bay)*

Prospecting in September 2000 in an area over 2.0 km north of the Mere showing had returned minor copper and nickel values from a small gabbro outcrop. In the same general area, a combined value of 1.90 g/t palladium, platinum and gold was obtained from a medium-grained gabbro boulder, the source of which is unknown (company press release, December 6, 2000).

The uniform, disseminated nature of the sulphide-PGE-mineralized zones and the number of such zones despite a paucity of outcrop suggest that additional zones are likely to be discovered in the course of further stripping or diamond drilling. Future exploration may also extend the 4 km length over which mineralized zones are currently known to be distributed and elucidate lithologic relationships and local structure. This will provide a context into which mineralization processes can be placed in order to plan additional exploration and generate new targets on this and neighbouring properties.

RECOMMENDATIONS FOR EXPLORATION

Platinum Group Element Exploration Models

Exploration for platinum group elements (PGE) has been at an increased level in the Thunder Bay South District for the past three years. This increase in exploration can be credited to a number of factors, including an increase in the price of palladium to over $1000.00 U.S. per ounce, settling down into the $300.00 to $400.00 per ounce range. The district hosts numerous PGE occurrences, ranging from grass-roots prospects to a producing mine (Lac des Iles). Mineralized host rocks range in age from Neoarchean to Mesoproterozoic. Several of the Mesoproterozoic intrusions, including the Crystal Lake gabbro and the Coldwell alkalic complex, contain large-tonnage, low-grade disseminated (contact-type) copper-nickel-PGE deposits (e.g., Great Lakes Nickel; Marathon deposit). While these deposits are currently uneconomic, there exists the potential for higher-grade, footwall or structurally controlled deposits within these mineralized environments.

Footwall copper-nickel-PGE deposits have long been known in the Sudbury Basin (Naldrett et al. 1982, 1994; Morrison et al. 1994). In light of the increasing price of PGEs, they have become high-priority targets. These high-grade PGE deposits are produced by the migration of fractionated, copper-rich fluids out of the Sudbury Igneous Complex, into footwall structural zones (ibid.). A similar mineralizing process may have produced the Local Boy ore zone, a high-grade copper-nickel-PGE-bearing massive sulphide within the Babbitt copper-nickel deposit in the Duluth Complex, Minnesota (Peterson 1998). The Local Boy deposit contains 2.2 million tons grading 4.65% Cu, 0.94 % Ni and 5 to 15 g/t PGE (Severson and Barnes 1991; M. Severson, Natural Resources Research Institute, personal communication, 2002).

Peterson (1998) suggested that there were four essential, ore-forming processes necessary to form copper-nickel-PGE deposits:

1) Accumulations of large quantities of Cu-Ni-sulphides in a mafic intrusion;
2) The presence or development of footwall structural zones;
3) Fractional crystallization of the sulphide melt and migration of the residual copper-rich liquid;
4) Concentration of the copper-rich liquid into discrete footwall structural zones.

The Thunder Bay District has potential for footwall copper-nickel-PGE deposits, especially in the Proterozoic rocks of the International Border/Pigeon River area (Great Lakes Nickel), as well as in the

Nipigon Basin and the Coldwell alkalic complex. The "Keel" zone on the Great Lakes Nickel property is described as gabbro/sediment contact mineralization located in a keel structure near the basal portion of the gabbro sill. Assay values ranged up to 2.72% Cu and 0.78% Ni and 3.245 g/t PGE + gold. A 1.8 m intersection (diamond drill hole 89-68) returned 1.9% Cu + Ni and 5.327 g/t PGE + gold (Resident Geologist's Files, Thunder Bay South District Thunder Bay).

The Geordie Lake gabbro in the Coldwell alkalic complex hosts the Mathias occurrence, currently being explored by LEH Ventures Ltd. Semi-massive chalcopyrite-bornite-magnetite stringers and pods occupying fractures were sampled near a cross-fault; selected grab samples returned 32.3% Cu, 0.10% Ni, 4.25 g/t platinum, 2.77 g/t palladium, 1.08 g/t gold and 112 g/t silver (Patterson et al. 1987).

Exploration companies drilling through contact-style PGE mineralization should consider doing down-hole pulse EM surveys, which might identify zones of semi-massive to massive sulphides which have been concentrated in footwall structures.

Rare Metal Pegmatites in the Highway 527 Area

Breaks et al. (2001) delineated an area between Walkinshaw Lake and De Courcey Lake on Highway 527, approximately 30 km north of Thunder Bay, that merits exploration for lithium- and tantalum-bearing pegmatites. Numerous, recently constructed logging roads provide excellent access to the area, both east and west of Highway 527.

Breaks et al. (2001) described rare metal mineralization within a pegmatite field near the Onion Lake Pit road, approximately 27 km north from Highway 11-17 on Highway 527. Quartz-rich patches containing light green beryl crystals up to 1 by 16 cm were noted at some localities, especially at UTM Zone 16 (NAD 83) coordinates 346199E, 5397916N. Black, possible oxide minerals were noted at locality UTM Zone 16 (NAD 83) coordinates 346512E, 5398007N. These two localities are just north of the intersection of the Onion Lake Pit road (Barnum Lake Road) and Highway 527.

At another locality, just north of the intersection of the Pace Lake Road and Highway 527 (UTM Zone 16 (NAD 83) coordinates 339218E, 5416563N), Breaks et al. (2001) described a pegmatite that contains abundant cordierite and apatite. Lithium values of 41 ppm were obtained from the cordierite-rich pegmatite (ibid.).

An area, east of Highway 527 and south of Tease Lake, has recently been logged. This area is along the presumed strike of the aforementioned, cordierite-rich pegmatites and contains abundant outcrops of coarse, pegmatitic granitoid rocks. This area is accessed from the Manchester Lake Road that intersects the Dorion Cut-Off Road, 10 km from Highway 527. Road 500 (off of Highway 527) accesses the general area as well, but a bridge over Spruce River has been removed and thus access to the western side of Tease Lake is difficult.

Prospectors are encouraged to look for rare metal-bearing pegmatites in this area. General guidelines for prospecting for pegmatites were also noted by Schnieders et al. (2001).

Potential Applications of an Olympic Dam Model in the Nipigon Basin

The search for Olympic Dam-type deposits in the Sibley and Animikie basins of the Thunder Bay–Nipigon area should be a high priority with mineral exploration companies. The same features that characterize the Olympic Dam model can be found throughout the Nipigon Basin in northwestern Ontario. It is beyond the scope of this description to produce a compendium of references for the Olympic Dam model, but the reader is directed to Reeve et al. (1990) and Pratt and Sims (1990).

Defining criteria for Olympic Dam-type deposits are well-developed in Reeve et al. (1990). The Olympic Dam deposit in Australia is situated in a large, hydrothermal breccia complex that is within the Roxby Downs granite. The deposit is hosted by early to mid-Proterozoic rocks (ca. 1.1 to 1.8 Ga). This breccia complex was formed by the interaction of hydrothermal, volcanogenic, sedimentary, and tectonic processes. Breccias are the primary hosts to the ore and range from primarily brecciated granite to a brecciated mass of hematite and quartz. Breccias tend to grade into one another and breccia boundaries can be nebulitic. In addition, intense alteration has resulted in the formation of rock types that bear little resemblance to the original compositions of the host rocks (ibid.).

Breccia classification is difficult because the gradation between types is indistinct and range from purely fractured granite to altered granite breccia. Breccias are more hematitic towards the central portion of the breccia complex and more granite-rich towards the margins. Megascopically, the breccias have been classified as granite-rich breccias, and hematite-rich breccias, with the hematite breccias further classified into hematite-quartz breccias, hematite breccias, and heterolithic hematite breccias. Detailed descriptions of these brecciated rocks can be found in Reeve et al. (1990). Broad, concentric zoning of the Olympic Dam breccia complex is evident; granite-rich breccias envelop, and are intermingled with, the hematite breccias. The hematite-quartz breccias occur mainly in the main core of the ore body. Hematite breccias occur as discrete bodies either within the other breccias or at the margins of the major breccia types.

Alteration at Olympic Dam is intense and consists of sericite, hematite, chlorite, silica and carbonate alteration phases. According to Reeve et al. (1990), these alteration phases are generally distributed as follows: sericitization is widespread and concentrated in the granitic breccias; hematite alteration increases towards the core of the breccia complex; chlorite alteration is patchy but widespread, although of moderate intensity, and increases with depth; silicification is restricted to discrete, irregular zones near the main hematite-quartz breccias of the central core; carbonate alteration is weak and generally restricted to the northeastern part of the deposit where siderite veins are abundant.

The Olympic Dam deposit contains anomalous concentrations of iron, copper, uranium, gold, silver, barium, fluorine, and rare earth elements, notably lanthanum and cerium; only copper, uranium, gold and silver are presently recovered (Reeve et al. 1990). The inferred resource is 2000 million t grading 1.6% copper, 0.6 kg/t U_3O_8, 0.6 g/t gold and 3.5 g/t silver. The measured and indicated resource is 450 million t grading 2.5% copper, 0.8 kg/t U_3O_8, 0.6 g/t gold and 6.0 g/t silver. This includes a proven reserve of 13 million t grading 3.0% copper, 1.1 kg/t U_3O_8, 0.3 g/t gold and 10.2 g/t silver (ibid.).

In the Thunder Bay–Nipigon area, uraniferous quartz-hematite breccias occur in the Goodmorning Lakes fault area near Dorion and have been described by Yule (1979) and Scott (1987). Coleman (1909) described hematitic iron occurrences in the Black Sturgeon area. Some of these were subsequently described by Scott (1987) and were found to contain uranium and traces of base metals. Analysis from a site located at the mouth of a canyon northeast of Black Sturgeon Lake (UTM Zone 16 (NAD 27) 5463389N, 369947E) yielded 800 ppm U, 100 ppm Ni, 64 ppm Co, 0.01 ounces of gold per ton, and 0.10 ounces of silver per ton (Scott 1987). Some radioactive hematite veins also contain copper; the highest copper value (3.10% Cu) was reported from the Split Rapids Dam occurrence (UTM Zone 16 (NAD 27) 5466724N, 369350E) (Scott 1987). Granite-hosted, hematite breccias are ubiquitous at these locations. A new logging road south of Roland Lake (UTM Zone 16 (NAD 27) 5459940N, 38487E) passes directly over one of the hematite deposits described by Coleman (1909). Intense granite-hematite brecciation is exposed on both sides of the road. Rocks at this locality are weakly radioactive. Three grab samples from the Roland Lake occurrence yielded the following analyses:

Sample	Au (ppb)	Ba (ppm)	Ce (ppm)	Co (ppm)	Cu (ppm)	Fe (%)	La (ppm)	K (%)	Ag (ppm)	Th (ppm)	U (ppm)
JFS-1	<5	680	25.6	0.8	2	1.48	11.5	2.48	0.10	42.4	1.8
JFS-2	<5	270	68.0	0.8	1	4.99	32.5	1.43	0.05	27.0	2.0
JFS-3	<5	1040	80.7	6.2	3	9.08	39.0	2.85	0.10	9.8	16.2

(Resident Geologist's Files, Thunder Bay South District, Thunder Bay)

Scott (1987) mapped uraniferous hematite breccias in the Jessie Lake area, near the Nipigon River. Large areas of hematite alteration have been mapped by Hart et al. (2000), in the Garden Lake area.

Corona Gold Corporation is exploring the English Bay area on the western shore of Lake Nipigon, using an Olympic Dam model (Resident Geologist's Files, Thunder Bay South District, Thunder Bay). Wilson (1910), Sutcliffe and Greenwood (1985), Scott (1987), Dean (1997) and Wood and Drost (1998) have described the English Bay area geology. The English Bay area is underlain by an anorogenic, fluorite-bearing, quartz-feldspar porphyry to equigranular granitic intrusion. The intrusion has a U-Pb age of 1.54 Ga (Davis and Sutcliffe 1985). Sutcliffe and Greenwood (1985) have suggested that the intrusion represents a felsic volcanic center because it includes xenoliths of felsite, porphyry, and flow-banded and pumiceous fragments. Sutcliffe (1991) also reported that this intrusion has elevated values of zirconium, yttrium, and rare earth elements. The English Bay intrusion exhibits a well-defined radiometric signature.

Corona Gold Corporation conducted an exploration program that consisted of ground and airborne magnetometer and electromagnetic and radiometric surveys, geological mapping and diamond drilling. Although no encouraging results were reported, favourable hematitic granite breccia rocks were encountered in the drilling (Wood and Drost 1998).

Other areas in the Thunder Bay South District can also be considered. The north-northeast-striking Jackpine River–Glacier Creek fault has been traced more than 60 km inland from Nipigon Bay (Lake Superior), where it cuts both Mesoproterozoic rocks and Neoarchean rocks of the Quetico Subprovince. The fault is suggested to be Proterozoic in age (Schnieders and Smyk 1990) and has at least five copper-silver-gold occurrences identified along a 20 km section of the fault (e.g., Moschuk, Glacier Creek, Michon, Reef Bay and Barbara Lake occurrences). Pye (1965) described the Glacier Creek (Potter) occurrence:

> The Potter copper deposit occurs along the Glacier Creek fault, about 8,500 feet [2.6 km] east-northeast of O'Keefe Lake in the extreme southeastern part of the map-area. It occurs where the fault cuts and truncates a band of sediments, 1,000 - 2,400 feet [305-730 m] wide, which occurs as an east-northeast-trending inclusion in granitic rocks. It is essentially a wide zone of brecciation, in which highly fractured biotite and augen gneisses, and some granitic rocks, are cut by narrow veins of quartz and calcite, and mineralized with disseminated pyrite and chalcopyrite. The mineralization has been traced N20°E in diamond drill holes for 2,400 feet [730 m]. It dips vertically and ranges up to 100 feet [30m] in width.

Marchand (1990) stated that the best intersection consisted of 0.50% Cu over 104 feet (31 m). Although very limited gold assaying was done over the core, a value of 0.06 ounces of gold per ton over 10 feet (3 m) was obtained. Gold values from a breccia zone have assayed as high as 0.13 ounces of gold per ton (ibid.). Drilling by Falconbridge Limited on Nipigon Bay in 1996 intersected a red, magnetite-rich, quartz-biotite granite (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

Major faults, such as the Gravel River–North Shore fault, Jackpine River–Glacier Creek fault, and the Greenhedge Lake fault should be investigated for Olympic Dam-type targets. Barite-fluorite veins and sulphide-rich breccias have been noted in the Rossport area (Schnieders et al. 1996; Resident Geologist's Files, Thunder Bay South District, Thunder Bay) and should also be investigated.

Gold in the Smoke Lake Area

The Smoke Lake area has been documented and recommended for exploration, most recently by Schnieders et al. (2000). The property is held by J. Bond, K. Fenwick, B. Gionet, D. Michano, P. Moses and R. Renner. A new gold discovery was made in 2002 by P. Moses (14.56 g/t gold) in altered and deformed monzonite. The Beggs Lake monzonite stock (Milne 1967) intrudes pillow lava and amphibolite. Four gold occurrences have already been discovered within 0.5 km of the monzonite-metavolcanic contact. The monzonite stock has a strong magnetic signature on the regional airborne magnetic survey (e.g., Map 60 025, Ontario Geological Survey 2001), and a possibly east-striking iron formation is observed just south

of the Beggs Lake stock. Sulphide-rich zones and lean iron formation assaying up to 8220 ppm Zn, 528 ppm Cu and 0.02 ounces of gold per ton have been sampled by the authors (Schnieders et al. 2000).

The gold occurrences include the Smoke Lake occurrence (0.942 ounces of gold per ton, including visible gold in quartz vein float); the Smyk zone (0.78 ounces of gold per ton from in-situ quartz veins); the Beaver Pond Float (20 g/t gold in pink to red, altered syenite to monzonite with numerous quartz stringers); the Moses–Goodchild Lake property (up to 8.6 g/t gold in sheared and carbonatized, pyritic schist) (Resident Geologist's Files, Thunder Bay South District, Thunder Bay). The Goodchild Lake property has been optioned to Teck Cominco Limited and Saxony Explorations Ltd. (*Canada Stockwatch*, November 09, 2001).

The south-southeastern contact of the Beggs Lake stock is a prime gold exploration target. Numerous quartz veins with abundant tourmaline have been noted in several locations near the contact. The four gold occurrences, distributed over a 1 km strike length, require additional prospecting and mechanical stripping to delineate the extent of this gold mineralization.

OGS ACTIVITIES AND RESEARCH BY OTHERS

1) C. Vaillancourt, Precambrian Geoscience Section, OGS, initiated a study of the potential for platinum group element mineralization in mafic to ultramafic intrusions in Ontario under the auspices of *Operation Treasure Hunt* (Vaillancourt et al. 2001). It will result in the development of a comprehensive database outlining critical geological and geochemical information on these intrusions. The main focus of the project was extensive sampling of the various constituent rock types within an intrusion. Approximately 1300 samples from 98 intrusions were submitted for geochemical analysis and thin section petrography.

   Intrusions sampled in the Thunder Bay South District included: Abiwin; Buck Lake; Bulldozer; Burchell Lake; Coldwell alkalic complex; Eva Lake; Garden Lake; Haines Gabbro; Hele Township; Kawene; Killala Lake; Moshkinabi Lake; Mud Lake; Musher Lake; Nickleby–Fire lakes; North Elbow Lake; Nym Lake–Bergman Lake; Roaring River–Allely Lake; Ruffo Lake; Samuels Lake; Shabotik; Shebandowan Mine; and White Lake (ibid.).

2) F.W. Breaks, Precambrian Geoscience Section, OGS, continued his *Operation Treasure Hunt* study of fertile peraluminous granites and related rare-element pegmatite mineralization in the Superior Province (Breaks et al. 2001). Field work in the Thunder Bay South District focused on granitoid rocks and pegmatites within the Quetico Subprovince in the following areas: Armstrong Highway (Highway 527) cross-section (Onion and DeCourcey lakes); Niobe–Nym lakes; and Wisa Lake. This work led to the discovery of rare-element-mineralized pegmatites in the Niobe–Nym lakes and Onion Lake areas. In addition to quartz, muscovite/biotite, and potassium feldspar, prospective pegmatites were noted to contain beryl, garnet, cordierite, cleavelandite, apatite and an as yet unidentified, black oxide minerals, that may be the tantalum- and niobium-bearing phases (ibid.).

3) R. Dyer, Sedimentary Geoscience Section, OGS, supervised a high-density lake sediment geochemistry survey in the Lac des Iles–Black Sturgeon Lake area under *Operation Treasure Hunt* (Dyer and Roy 2001). In the survey area, 2237 samples were collected covering NTS blocks: 52A/13, 14; 52B/16; 52H/2 to H/7, inclusive.

4) J. Jackson conducted a high-density regional lake sediment and water geochemistry survey in the Dayohessarah Lake area (Jackson 2001). The western portion of the survey area fell within the Thunder Bay South District, covering Shabotik, Mikano, Flood and Cecile townships and portions of McGill, Atikameg, Bryant, McCron and Knowles townships.

5) The Ministry of Northern Development and Mines commissioned a physical evaluation and assessment of bedrock aggregate resource potential on the north shore of Lake Superior (Jagger Hims Limited et al. 2001). Bedrock geology was studied for a distance of 5 km inland from the lake in

order to identify potential sources of high-quality aggregate. Samples were taken for selected quality testing. Several candidate resource areas were studied in the Thunder Bay South District, including the Heron Bay pluton, Coldwell alkalic complex, Little Steel Lake area; Terrace Bay batholith; Crosman Lake batholith; Nipigon diabase sills; Nipigon Bay (Keweenawan) area; Dorion diabase sill; Thunder Bay area; and south of Thunder Bay to the International Border (ibid.).

6) G. Williams (The University of Adelaide, South Australia) and P. Schmidt (CSIRO, North Ryde, New South Wales) are investigating the paleomagnetism of the Paleoproterozoic Gunflint Formation and Sibley Group near Thunder Bay.

A number of theses are in progress at Lakehead University, Thunder Bay:

Student	Topic
J. Hallé	Paleomagnetism and magnetic fabrics of mafic intrusions in the Quetico belt near Atikokan (HBSc)
D. Heerema	Fluid inclusions in pegmatitic phases of the Lac des Iles complex (HBSc)
I. Kelso	Geology and fluid inclusion studies on the Thunder Bay agate mine (HBSc)
T. Lemmetty	Paleomagnetism and magnetic fabrics of late Archean lamprophyres, Shebandowan area (HBSc)
C. Lucas	The Akamas ophiolite as a tectonic analogue of Archean greenstone deformation (HBSc)
B. Rogala	Stratigraphy and sedimentary petrography of the Mesoproterozoic Sibley Group (MSc)

C. Foster (BSc candidate, Université du Québec à Chicoutimi) is studying platinum group mineralization and alteration in the Twilight Zone, Lac des Iles Mine.

N. Pettigrew (MSc candidate, University of Ottawa, Ottawa, Ontario) is working on the Samuels Lake mafic-ultramafic intrusion and its associated copper-nickel-PGE mineralization. B. Lassen (PhD candidate, University of Ottawa, Ottawa, Ontario) is studying the petrology and petrochemistry of other Quetico intrusions in the Atikokan area. Both theses are supervised by Dr. K. Hattori.

Table 5. Publications received by the Thunder Bay South Resident Geologist's Office in 2001.

Title	Author(s)	Type and Year of Publication
New exploration potential at the Marathon palladium project, northwestern Ontario	P.C. Walford, C.T. Barrie, R. Middaugh and R. Chataway	Ontario Exploration and Geoscience Symposium, Toronto, December 10-12, 2001, Speaker Abstracts, p.1-2
Geology of North American Palladium Ltd.'s Lac des Iles Mine	M.J. Lavigne	Ontario Exploration and Geoscience Symposium, Toronto, December 10-12, 2001, Speaker Abstracts, p.2
PGE Mineralization in the Legris Lake mafic-ultramafic complex, western Wabigoon subprovince	N.T. Pettigrew	Ontario Exploration and Geoscience Symposium, Toronto, December 10-12, 2001, Speaker Abstracts, p.3
A metamorphosed evaporite sequence from the Sibley Basin	B. Rogala and P.W. Fralick	47th Institute on Lake Superior Geology, Annual Meeting, Madison, Wisconsin, May 9-12, 2001, Proceedings Volume 47, Part 1, p.83-84
A synopsis of Archean and Proterozoic platinum group element mineralization in the Thunder Bay District, Ontario	M.C. Smyk, J.K. Mason, B.R. Schnieders and G.M. Stott	47th Institute on Lake Superior Geology, Annual Meeting, Madison, Wisconsin, May 9-12, 2001, Proceedings Volume 47, Part 1, p.91-92
The Blake gabbro: a taxitic-textured gabbro sill south of Thunder Bay, Ontario	S. Beskar	47th Institute on Lake Superior Geology, Annual Meeting, Madison, Wisconsin, May 9-12, 2001, Proceedings Volume 47, Part 1, p.1
Alteration and PGE-Au mineralization in the North Roby zone, Lac des Iles Mine, northwestern Ontario	D.B. Bihari and S.A. Kissin	47th Institute on Lake Superior Geology, Annual Meeting, Madison, Wisconsin, May 9-12, 2001, Proceedings Volume 47, Part 1, p.3
Fluid inclusion evdidence for a role for hydrothermal activity in the Roby Zone, Lac des Iles Mine, northwestern Ontario	J.R. Johnson and S.A. Kissin	47th Institute on Lake Superior Geology, Annual Meeting, Madison, Wisconsin, May 9-12, 2001, Proceedings Volume 47, Part 1, p.41-42
Geology and platinum group element mineralization of the Coldwell alkaline complex	M.C. Smyk, R.P. Sage, P.C. Walford, R. Middaugh, R. Chataway and A. MacTavish	*Superior PGE 2001*, Canadian Institute of Mining and Metallurgy, Geological Society Field Conference, Thunder Bay, September 16-19, 2001, Field Trip Guidebook, 31p.
PGE mineralization in the Mine Block intrusion, Lac des Iles intrusive complex	M.J. Lavigne, K. Kettles, S. Burgess, M. MacIsaac, J. Rickard and G. Katchen	*Superior PGE 2001*, Canadian Institute of Mining and Metallurgy, Geological Society Field Conference, Thunder Bay, September 16-19, 2001, Field Trip Guidebook, 14p.
The Legris Lake mafic-ultramafic complex	N. Pettigrew	*Superior PGE 2001*, Canadian Institute of Mining and Metallurgy, Geological Society Field Conference, Thunder Bay, September 16-19, 2001, Field Trip Guidebook, 13p.
Geology and Cu-Ni-PGE mineralization of the Duluth Complex and related intrusions	J.D. Miller and M.J. Severson	*Superior PGE 2001*, Canadian Institute of Mining and Metallurgy, Geological Society Field Conference, Thunder Bay, September 16-19, 2001, Field Trip Guidebook, 64p.
Intrusions of the Nipigon Basin	D.P. Parker (ed.), B. Middleton, B.R. Schnieders, M.C. Smyk and J.F. Scott	*Superior PGE 2001*, Canadian Institute of Mining and Metallurgy, Geological Society Field Conference, Thunder Bay, September 16-19, 2001, Field Trip Guidebook, 43p.
Asymmetric reversals in the Gunflint Formation, Canada and implications for paleoreconstructions	P.W. Schmidt and G.E. Williams	General Assembly of the European Geophysical Society, Proceedings Volume (in preparation)
The Paleoproterozoic Rove Formation of northwestern Ontario: a turbidite-dominated shelf sequence	O. Amurawaiye	Unpublished HBSc thesis, Department of Geology, Lakehead University, Thunder Bay (2001)
A metamorphosed evaporite section from the Sibley basin, northwestern Ontario	B. Rogala	Unpublished HBSc thesis, Department of Geology, Lakehead University, Thunder Bay (2001)
Geco-Manitouwadge; Hemlo	Ontario Geological Survey	60 000 series Hard Copy Maps (1:50 000 scale: Purchased Data

Table 6. Mineral deposits not being mined in the Thunder Bay South District in 2001.

Abbreviations

AF ..... Assessment Files
CMH ..... Canadian Mines Handbook
GR ..... Geological Report
MDC ..... Mineral Deposit Circular
MDIR ..... Mineral Deposit Inventory record
MLS ..... Mining Lands, Sudbury
MR ..... Mining Recorder
NM ..... The Northern Miner
OFR ..... Open File Report
PC ..... Personal Communication

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Anderson Lake 52A/10NE	Mo	1 346 000 T @ (grade unstated)	Open for staking	W.N. Ingham (16/06/59) in Prospectus, Lindsay Explorations Ltd. (19/06/59)	Inactive
Ardeen Mine 52B/10SE,SW	Au	90 650 T @ 15.3 g/T Au (uncut) [84 904 T @ 11.6 g/T Au, assays cut to 2 oz Au /t]; inferred resource of 1 082 939 T @ 14.4 g/T Au (uncut) [991 739 T @ 11.2 g/T Au, assays cut to 2 oz Au /t]	Pele Mountain Resources Inc. (CMH 2001-2002, p.290)	The Ontario Prospector, v.1, no.3, p.35 (1998); CMH 2001-2002, p.290	Over $2 M spent in exploration since acquisition in 1996
Atikokan Iron Mine 52B/14	Fe, Cu	12 000 000 T @ 35% Fe, 0.040% Cu	K. Bjorkman (Resident Geologist's Files)	NM (26/10/72)	Inactive
Aumacho (Brink) 42E/05SW	Li	759 475 T @ 1.65% Li_2O, plus 96 000 T @ 1.5% Li_2O	A. Hayes (Resident Geologist's Files)	GR 31, p.64 (1965)	Active; VLF-EM survey conducted in 1995
Coco-Estelle 42E/03SW	Au	53 700 t @10.7 g/t	Inmet Mining Corporation (Resident Geologist's Files)	AF	Inactive; last optioned to Battle Mountain Canada Ltd. 1996-97
Coldstream Porphyry 52B/10SE	Au	3.2 MT @ 0.066 opt Au	Newhawk Gold Mines Ltd. (CMH 1999-2000, p.295); merged into wholly owned subsidiary of Silver Standard Resources Inc. (CMH 2001-2002, p.261)	GR	Drilled by Noranda and Freewest 1990/1991; now seeking JV partner
Conway 52H/08NE	Li	1.83MT @ 0.96% Li_2O to 300 m	E.S. Conway (Resident Geologist's Files)	GR 31, p.68 (1965)	inactive

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Coubran Lake 42D/16NW,SW	Cu, Fe, Ti, P	60 MT @ 0.2% Cu, 27% Fe, 5% Ti, 5% P; plus 32 MT @ 0.3% Cu, 23% Fe, 0.02% Ni, 2.48%Ti, 0.36% P	Franco-Nevada Mining Corp. Ltd. (CMH 1996-97, p.173)	AF (F.N. 2.14737; 1991)	87 leases and additional claims acquired from acquisition of Redstone Resources Inc.; optioned currently to Aurogin Resources Ltd.
Dead Horse Creek North 42D/15SE	Pb, Zn, Ag	14 000 T @ 1.45% Pb, 7.28% Zn, 8.27 opt Ag	G. Michano (2 of 8 original patented claims); remainder open for staking (Resident Geologist's Files)	Resident Geologist's Files	Inactive
Dead Horse Creek South 42D/15SE	Pb, Zn, Ag	35 000 T and 36 000 T (Zones 1 and 2) @ 19.87% Pb, 9.08% Zn, 27.65 opt Ag	J. McCabe (Resident Geologist's Files)	(Resident Geologist's Files)	Inactive
Dorion Mine 52A/15	Pb, Zn	Maximum of 35 000 T @ 10% Pb	D. Petrunka Estate (Resident Geologist's Files)	Prospectus, Andowan Mines Ltd. (30/03/57)	Inactive
Elizabeth Mine 52B/13SE	Au	250 000 tons @ 4.57 g/t Au	R. Moffatt (Resident Geologist's Files)	CMH, 1998-99, p.309	Inactive
Great Lakes Nickel 52A/4SE	Cu, Ni, PGE	45.6 MT @ 0.344% Cu, 0.183% Ni; Pt & Pd values	Great Lakes Nickel Limited (CMH 2001-2002, p.176)	CMH 2001-2002, p.176	1970's bulk sample and feasibility study
Hammond Reef 52B/14NW	Au	85 mt @ 0.93 g/t Au (= 2.56 million oz Au)	Pentland Firth Ventures Ltd. (CMH 2001-2002, p.291)	News release, Pentland Firth Ventures Ltd., 1997	1997: drilling, channel sampling and inventory calculation
Hemlo (Interlake) 42C/12NW	Au	10.8 M tons @ 0.216 opT Au (= 2 328 000 oz Au)	Franco-Nevada Mining Corporation Limited (CMH 2001-2002, p.152)	First-Quarter Report, Franco-Nevada Mining Corporation Limited, 1999	Advanced exploration drifting and underground diamond drilling 1998-1999; Teck Corporation and Homestake Canada Inc. have right of first proposal
Jack Lake 52B/14SW	Au	Possible: 75 000 T @ 0.35 opT Au and 3000 T @ 0.30 opT Au[1]; or 100 000 T @ 0.45 opT[2]	M. Wicheruk (Resident Geologist's Files)	[1]OFR 5332, p.J-7 (1981) [2]Annual Report, Asamera Inc. (1981)	Inactive
Jean Lake 42E/05NW	Li	1.689 MT @ 1.30% Li_2O	Golden Nugget Exploration Inc. (CMH 2001-2002, p.169; Resident Geologist's Files)	Jean Lake Lithium Mines Ltd., Annual Report (1957)	Inactive

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Lac La Croix 52B/05SW	Li	1.525 MT @ 1.27% Li_2O	Within Quetico Provincial Park	AF	Mining Lease of Occupation expired in 1970
M.N.W. 52H/04NE	Li	40 000 T "high-grade Li"	Golden Nugget Exploration Inc. (CMH 2000-2001, p.182; Resident Geologist's Files)	Geological Survey of Canada, Economic Geology Report 21, p.61 (1965)	Option to earn 70% interest granted to Platinova A/S in 2001 (CMH 2001-2002, p.296)
Marathon prospect 42D/16SW	Cu, Ni, PGE	21 261 000 t measured and indicated resources grading 1.32 g/t Pd, 0.34 g/t Pt, 0.12 g/t Au, 0.40% Cu; (=1 768 000 ounces Pt+Pd)	Polymet Mining Corp. (CMH 2001-2002, p.305); currently optioned to Geomaque Explorations Ltd.	Press Releases, October 16, 2001, and November 06, 2001, Geomaque Explorations Ltd.	Plans to maintain leases in good standing; feasibility study conducted in 1989; exploration resumed in 2000
McVittie 52H/08NE	Li	261 000 T @ 1.03% Li_2O	Golden Nugget Exploration Inc. (CMH 2001-2002, p.169; Resident Geologist's Files)	GR 31, p.89 (1965)	Inactive
Nama Creek 52H/08NE	Li	4 292 232 tons @ avg. 1.06% Li_2O	Coniagas Resources Limited (CMH 2001-2002, p.98)	CMH 2001-2002, p.98	Inactive since 1957
Nicopor 42D/14NW	Ni, Cu	185 000 T @ 0.48% Ni, 0.26% Cu (0-90 m); plus 190 000 T @ 0.40% Ni, 0.12% Cu (90-180 m)	B. Fowler and M. Shuman	Zenmac Metal Mines Ltd., Annual Report (1970)	Optioned to Novawest Resources Inc.; explored in 2001
North Shores 42D/14SW	Au	Geological reserves of 2Mt @ 2.2 gpt Au (Afric Zone)	Autotrac Ltd.; currently optioned to International Taurus Resources Inc. (CMH 2001-2002, p.206)	Resident Geologist's Files	Explored in 1997 by Cyprus Canada Inc.; currently optioned to International Taurus Resources Inc.
Ontario Lithium (Jackpot) 42E/05SW	Li	1.18 MT @1.084% Li_2O	International Precious Metals Corporation (CMH 1997-98, p.250) [company address and status unknown; CMH 2000-2001, p.220]	CMH 1997-98, p.250	Drilling in 1994
Pistol Lake 52B/09NW	Au	9.6 mt @ 1.4 g/t Au or 2.9 mt @ 2.6 g/t Au	D. Parker and B. D'Silva	GR	Drilled by Detector Resources Ltd. 1994-95
Powell 52B/07SW	Au	250 000 T @ 0.25 opT Au	Saganaga Resources	NM, Jan. 22, 1990	Milling bulk sample on site, 1992

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Prairie Lake 42E/02SE	U, Nb, REE, wollastonite	200 000 T @ 1.8 lbs/T U_3O_8, 5.0 lbs/T Nb_2O_5	Nuinsco Resources Limited, World Wide Website, www.nuinsco.ca	NM (03/05/79)	Prefeasibilty study on cement/lime products completed with positive results
Sapawe Mine 52B/14SW	Au	528 614 T @ 0.31 opT Au	Sapawe Gold Mines Ltd. (Resident Geologist's Files)	Press release, March 10, 1995	Diamond drilling, 1995
Sawbill Lake 52B/14	Au	66 600 T @ 0.20 opT Au		OFR 5332, p.J-4 (1981)	
Schreiber-Pyramid 42D/14SE	Au	107 T @ 0.71 opT Au	B. Fowler (Resident Geologist's Files)	Resident Geologist's Files	Inactive; last worked in 1992
Silver Mountain 52A/04NW	Ag	60 000 T @ 5.0 opT Ag, 12% CaF_2		NM (28/10/54)	
Silver Islet 52A/07SW	Ag	115 000 T @ 40 opT Ag in dump[1], plus 300 000 oz Ag in roof pillar[2]; or 1 050 000 oz Ag[3], plus 750 000 oz Ag in pillars and stopes[4]	Cross estate (Resident Geologist's Files)	[1]MP 71, p.44 (1976) [2]MRC 10, p.74 (1968) [3]NM (18/10/79) [4]NM (10/02/83)	Dump material processed *ca.*1984 by QC Explorations Ltd.
Snodgrass Lake 52B/10SE	Au	60 mt @ 1.1 g/t Au	Moss Lake Gold Mines Ltd. (CMH 2001-2002, p.251)	CMH 2001-2002, p.251	1996 evaluation work and drilling; seeking JV partner
Stewart / Fire Tower 52A/12SE	Au	60 000 t @ 3.0 g/t Au	M. Stewart	GR	Last explored by Avalon Ventures Ltd. 1997-1998
Sunbeam 52B/14	Au	4410 T @ 0.42 opT Au	[unknown]	OFR 5332, p.J-2 (1981)	Acquired by Allegheny Mines Ltd. in 1996 (company delisted 1999)
Swamp River 52B/09SE	Au	998 000 T @ 0.12 opT Au (incl. 675 000 T @ 0.146 opT Au)	Band-Ore Resources Ltd. (CMH 2001-2002, p.48)	CMH 2001-2002, p.48	Bulk sample, feasibility study 1975; drilling 1987, 1995
Vanguard 52B/09NW	Cu, Zn, Au, Ag	East Vanguard: 100 000 T @ 1.8% Cu, 3.4% Zn, 0.22 opt Ag, 06 to 0.19 opT Au; West Vanguard: ~200 000 T @ 1.3% Cu, 1% to 2% Zn, 0.28 opT Ag	C. Bumbu, M. Fogen and J. Martin (Resident Geologist's Files)	News release, Allegheny Mines Corporation, Nov. 4, 1997	Drilling by Allegheny in 1997; 1998 exploration (company delisted 1999)
Vegan 42E/05SW	Li	750 000 T @ 1.38% Li_2O	Golden Nugget Exploration Inc. (CMH 2001-2002, p.169; Resident Geologist's Files)	NM (22/03/56)	Inactive

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Willecho and Willroy 42F/04NW	Cu, Zn, Ag	759 448 T @ 4.42% Zn, 0.28% Cu, 1.47 opt Ag (combined)	Noranda Inc. (The Chronicle-Journal 25/10/98)	Willroy Mines Ltd., Annual Report (1976)	Past producers; last optioned/worked by Noranda Mining and Exploration Inc.
Winston Lake 42D/14NW	Cu, Zn	598 000 t @ 1.0% Cu, 21.2% Zn (incl. 33% dilution)	Inmet Mining Corporation	Inmet Mining Corporation, pers. comm., 1999	Mine closed, February, 1999
Wisa Lake 52C/08NE	Li	330 000 T @ 1.15% Li_2O	P. Gagne (A. Eveleigh, pers. comm. 2002)	Manager's Report, Lexindin Gold Mines Ltd. (1958)	Diamond drilling, 1950's

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Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.